Chapter 7

GA 400 Corridor Analysis

CHAPTER 7: GA 400 CORRIDOR ANALYSIS

The Northern Sub-Area Study/GA 400 Corridor Analysis (NSAS) recognized from the very beginning that the GA 400 Corridor was one of the most critical transportation corridors in the Study Area. Not only does it handle large north-south road and transit volumes to and from the Study Area, it also serves as a major means of travel within the Study Area itself. One of the reasons for the high volumes is that the GA 400 Corridor has been a major attractor for much of the residential and employment growth that has occurred in the Study Area over the past 15 years, and will continue to be so in the foreseeable future.

In recognition of the importance of this corridor, the Study examined possible strategies for improving mobility and accessibility in the GA 400 Corridor for four time frames:

1. What could be done within a five-year period (up to the beginning of 2008)
2. Actions that could be undertaken in five to 15 years
3. Another set of investments that could be implemented in 15 to 25 years
4. Longer-term concepts that should be considered beyond 25 years

In essence, the multi-year improvement strategy resulting from this effort was designed to provide short-term, intermediate-term and longer-term improvements to this vital transportation corridor. Given the nature of transportation investment and the time it takes to begin construction, the five-year investment horizon necessarily focused on what could be accomplished primarily through operational improvements and on site-specific improvements at key bottleneck points, such as interchange ramps.

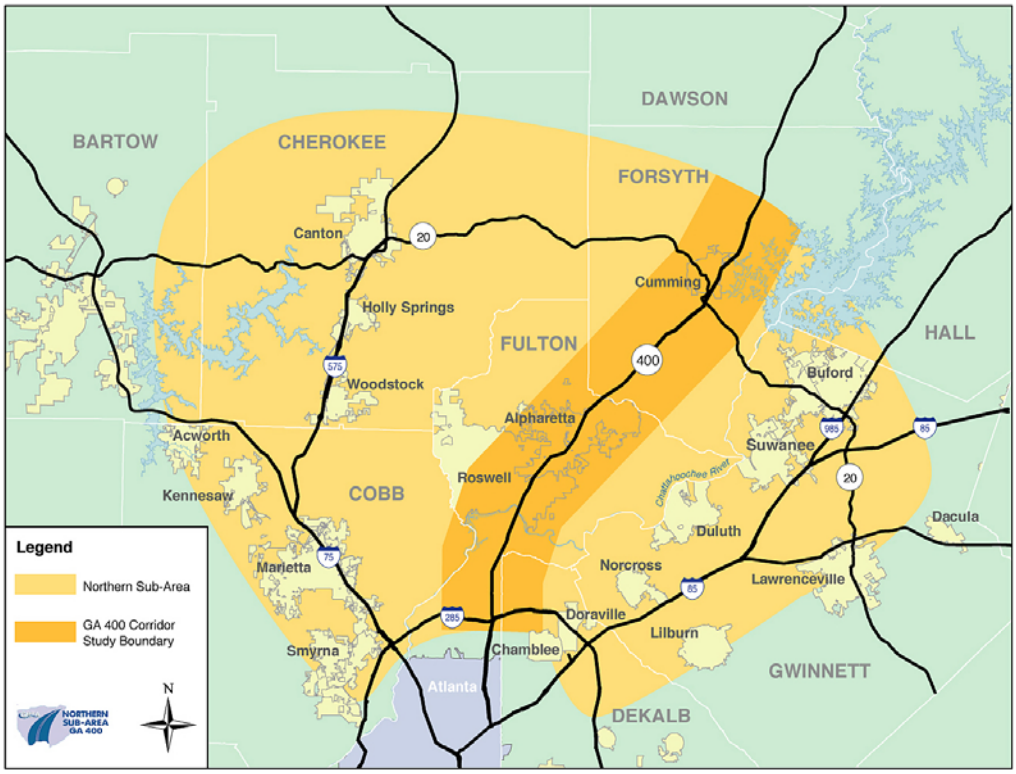
Importantly, the GA 400 Corridor improvement program examined changes to GA 400 itself, actions to improve connecting roads within five miles of the freeway, transit improvements, and land use policies. The GA 400 Corridor Analysis called for the development of specific project recommendations in the Corridor, as distinct from the concurrently-conducted Northern Sub-Area Study, which carried out system-wide assessments.

This chapter presents the results of the GA 400 Corridor Analysis, with emphasis given to both transportation and land use recommendations for the corridor.

7.1 THE GA 400 CORRIDOR

The boundaries of the GA 400 corridor are shown in Figure 7.1-1. As shown, the corridor extends from just below the GA 400/I-285 interchange to three miles north of SR 369 in Forsyth County. The eastern and western boundaries were established as being five miles from the center line of GA 400 itself.

Figure 7.1-1 | The Georgia 400 Corridor



Major portions of Alpharetta, Cumming and Roswell are included within the corridor Study boundary. An estimated 25 percent of the Study Area's residential population and 30 percent of its employment reside in the 220 square miles of this corridor. GA 400 itself is one of the most-traveled roads in the entire Atlanta region, with many of the intersecting arterial roads similarly experiencing heavy use. The daily volumes illustrated in Table 7.1-1 indicate the importance of the highways in this corridor to regional mobility and the expectation of increased utilization.

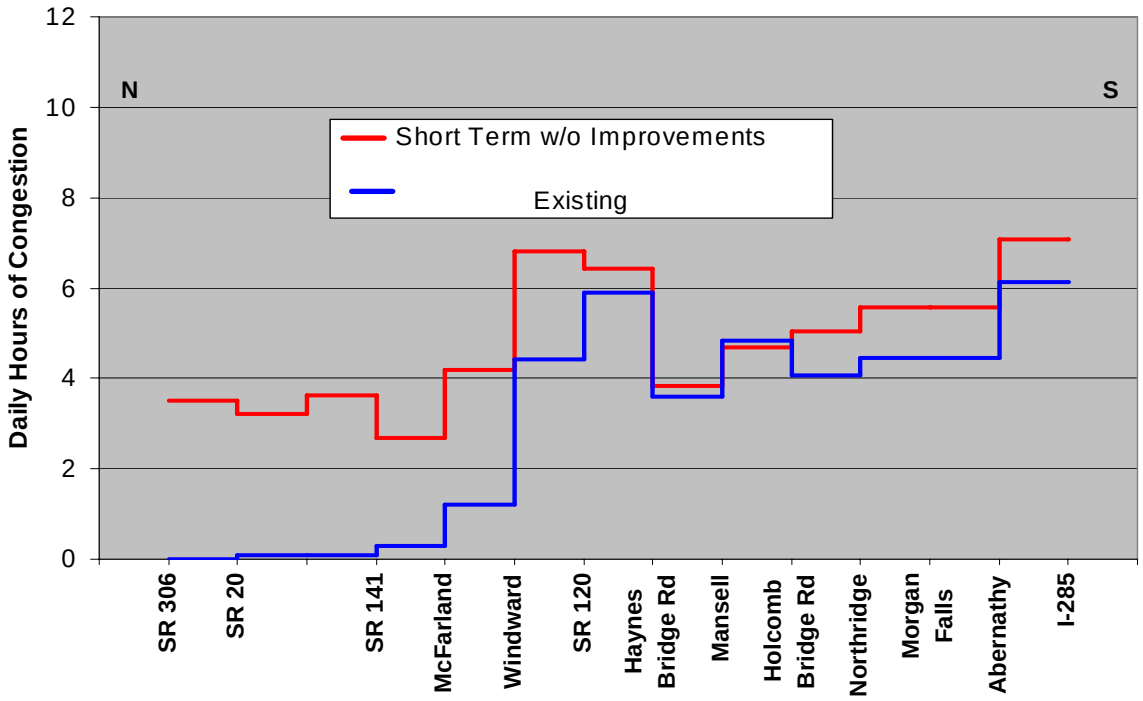
The need for congestion relief on GA 400 itself is indicated in Figure 7.1-2. Daily hours of congestion are expected to increase dramatically, especially north of Windward Parkway, over the next five years. When the increase in congestion on GA 400 over the next 25 years is projected, with no improvements, the amount of delay becomes unacceptable.

Transit ridership is also an important part of GA 400 Corridor travel. Currently, a total of 16,000 daily transit trips are made on five bus routes within the corridor, and 6,200 daily trips are taken on the MARTA north line (measured at the North Springs station). The ARC 2025 RTP calls for extending the north-south heavy rail line from the existing terminus at the North Springs station to the vicinity of the GA 400/Windward Parkway interchange.

Table 7.1-1 | GA 400 Daily Traffic Volumes

	2000 Volumes	Projected 2025 Volumes
GA 400/Just south of Abernathy Road	205,000	275,000
GA 400/Just south of Holcomb Bridge Road	200,000	239,000
GA 400/Just south of Haynes Bridge Road	109,000	184,000
GA 400/Just south of Windward Parkway	81,000	167,000
GA 400/Just south of SR 20	67,000	113,000
GA 400/Just south of SR 369	54,000	103,000
Abernathy Road/West of GA 400	53,000	56,000
Holcomb Bridge Road/West of GA 400	77,000	92,000
Windward Parkway/West of GA 400	29,000	36,000

Figure 7.1-2 | Increase in Congestion on GA 400 over the Next Five Years

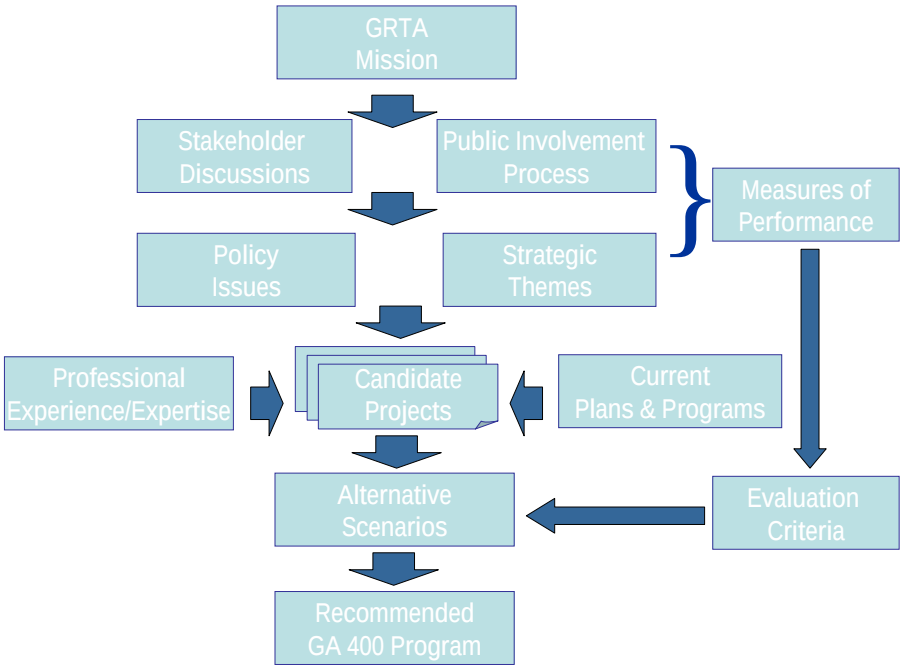


7.2 THE GA 400 PLANNING PROCESS

The GA 400 planning process consisted of two major efforts. The initial effort was a focused assessment of GA 400 with the intent of recommending projects and strategies that could be implemented within a five-year time frame. These initial GA 400 recommendations were provided to GRTA with the expectation that they would be refined and added to longer-term recommendations that resulted from the larger study effort. Thus, the recommendations for improvements in the GA 400 Corridor were targeted on short-, intermediate- and long-term improvement programs.

The short-term planning process for the GA 400 Corridor Analysis is shown in Figure 7.2-1. In keeping with the process followed throughout the NSAS, the strategic themes identified through the public involvement process along with current policies, project proposals, and the technical expertise of the Study Team were used to develop a recommended GA 400 improvement program. The short-term improvement recommendations resulted from an examination of different scenarios or investment assumptions.

Figure 7.2-1 | GA 400 Short-Term Planning Process



The primary concerns identified early-on in the GA 400 Corridor analysis included:

- Poor road and transit east-west connections
- Congestion on GA 400 at key bottleneck points
- Insufficient lane capacity on GA 400 for longer distance travel
- Few transit options
- Inadequate linkage between land use plans and transportation investment
- Challenge of "fixing" GA 400 with minimal adverse impact on neighborhoods

With the completion of the short-term assessment (documented in Appendix R), the analysis expanded into the entire Northern Sub-Area and assessed system-wide transportation and land use alternatives. These were found to have varying effects on area-wide congestion, but in each the GA 400 Corridor remained severely congested and required additional attention. Thus the Study returned to a detailed assessment of the GA 400 Corridor and, consistent with the Atlanta Transportation Agreement, developed specific project recommendations to address congestion over the short, intermediate and long range, as documented herein. The GA 400 recommendations were developed using the following principal objectives:

- Provide the earliest possible significant relief to current congestion
- Suggest recommendations that are consistent with today's financial limitations
- Minimize right-of-way takings and environmental and community impacts
- Maintain consistency with GDOT and Regional Transit Action Plan (RTAP) recommendations to the extent possible

7.3 IMPROVEMENTS IN THE GA 400 CORRIDOR: SHORT TERM (+/- 5 YEARS)

Different scenarios or investment assumptions were used to test the level to which improved mobility and accessibility could be provided in the corridor. These scenarios included:

- A base case (2000 road, transit and land use conditions) that served as a point of comparison for the results from the other scenarios
- An existing ARC Transportation Improvement Program (TIP), which included the projects that have been approved by GRTA and ARC to be constructed over the 2002-2004 time frame, and which have been shown to be in air quality conformance
- An infrastructure-oriented investment scenario that assumed the investment found in the ARC TIP for 2002-2004, plus an additional $100 million in road, bridge and bike/pedestrian-related projects

- An operations-oriented investment scenario that assumed the investment found in the ARC TIP for 2002-2004, plus an additional $100 million in operational improvements, including 25+ intersection improvements; corridor-level application of intelligent transportation system (ITS) actions including a joint ITS operations center for Roswell and Alpharetta; five new park-and-ride lots with 3,000 spaces; and the purchase of 55 buses (40 express and 15 local) for new transit service in the corridor. This scenario also included the stabilization of the GA 400 shoulders for use by express bus operations.

The operations and infrastructure investment scenarios each identified those projects that provided the most important benefit to the GA 400 Corridor. For the infrastructure scenario, these included improvements at the following locations:

- Add a lane in both directions on GA 400 from Haynes Bridge Road to Windward Parkway
- Widen State Bridge Road from Kimball Bridge Road to SR 141
- Widen SR 9 from Cumming to SR 20
- Widen SR 141 from Fulton County line to SR 9
- Widen SR 20 from GA 400 to Samples Road
- Enhance the interchange capacity at I-285 and Roswell Road

For the operations scenario, these included improvements at:

- GA 400 and SR 369
- SR 9 and SR 371
- Dunwoody Place and GA 400 Northridge ramps
- Roberts Road and GA 400 Northridge ramps
- All GA 400 interchanges and ramp gore (connection) areas

The best projects from each of these scenarios were recommended for implementation in the short-term improvement package. The intermediate and longer-term improvement packages were based on the demand and operations analyses that were used throughout the Study effort.

It is interesting to note the differences in outcomes between an infrastructure-oriented investment scenario and a scenario more oriented toward operations improvement. This is the first time in the Atlanta region that such a comparison has been made on the scale of the NSAS. Table 7.3-1 presents a comparative assessment of how each scenario relates to key evaluation criteria. As shown, the operations-oriented investment scenario produces significant, positive results.

Table 7.3-1 Comparison between Infrastructure- and Operations-Oriented Investment, Change from 2000 Base Year

	No-build	ARC TIP	Infrastructure	Operations
Vehicle hours	13.1%	-3.7%	-4.1%	-4.1%
Vehicle hours of delay	29.3%	-21.0%	-23.1%	-22.3%
Transit riders	-	1,470	2,175	17,084
Mode share-transit trips from corridor	-	3.9%	3.9%	5.2%
Mode share-transit trips to corridor	-	5.6%	5.7%	7.5%
Households within 0.5 mile of transit	43,900	43,900	43,900	52,200
Jobs within 0.5 mile of transit	143,800	143,800	143,800	154,100
Households within 5 miles of park-and-ride	92,700	107,600	107,600	127,100
Regional vehicle miles traveled	9.01 million	5.6 million	5.72 million	5.57 million

7.3.1 Recommended Transportation Infrastructure Improvements

This first category of actions examined the most cost-effective investment that could be made to improve the transportation system in the corridor. Most of the options considered in this phase of the Study were those that had been considered in other plans, ideas offered by public officials or identified through the public involvement process, or Alternatives developed by the Study Team. In some cases, the options had already been identified by the existing regional transportation plan as beneficial. However, analysis as part of the NSAS showed that the projects' benefits would warrant faster implemention.

Two major types of investments were considered—those aimed at improving travel on GA 400 itself, and those targeting other locations in the corridor where relatively modest investments could have a major impact.

The intent of the short-term improvements in the GA 400 Corridor was to recommend strategies and/or actions and/or projects that could be accomplished within five years and that would provide important corridor mobility and accessibility benefits. The recommendations fall into three major categories—transportation infrastructure, travel demand management strategies, and land use policies.

Short-Term GA 400 Improvements

The short-term recommendations for GA 400 are aimed at fixing bottlenecks on the freeway and improving transit service in the corridor. In particular, the two most important recommendations on GA 400 in the short term include widening GA 400 north of Holcomb Bridge Road and implementing express bus transit service by using the GA 400 shoulders.

The proposed highway and transit improvements in the short term include the following:

Highway Improvements

- Build one general purpose lane in each direction in the median from Haynes Bridge Road to McFarland Road. This was shown to be the most cost effective strategy in the entire NSAS area for reducing delay.
- By taking advantage of the construction mobilization that would occur to build the above lane, build an additional general purpose lane from Holcomb Bridge Road to Windward Parkway in the northbound direction. This lane would become a dedicated, concurrent HOV lane in the next (i.e., intermediate) phase of improvements. The GA 400 analysis looked at building the southbound lane as well, but determined that due to a difficult merge at Holcomb Bridge Road, this improvement should wait for intermediate phase improvements to help alleviate this merge issue. This analysis, shown in Figure 7.3-1, illustrates that with the added southbound lane, the southbound GA 400 merge at Holcomb Bridge Road experiences near-standstill conditions.
- Extend the south on-ramp to GA 400 from Holcomb Bridge Road 1,700 feet to the Chattahoochee River to help relieve the merge.

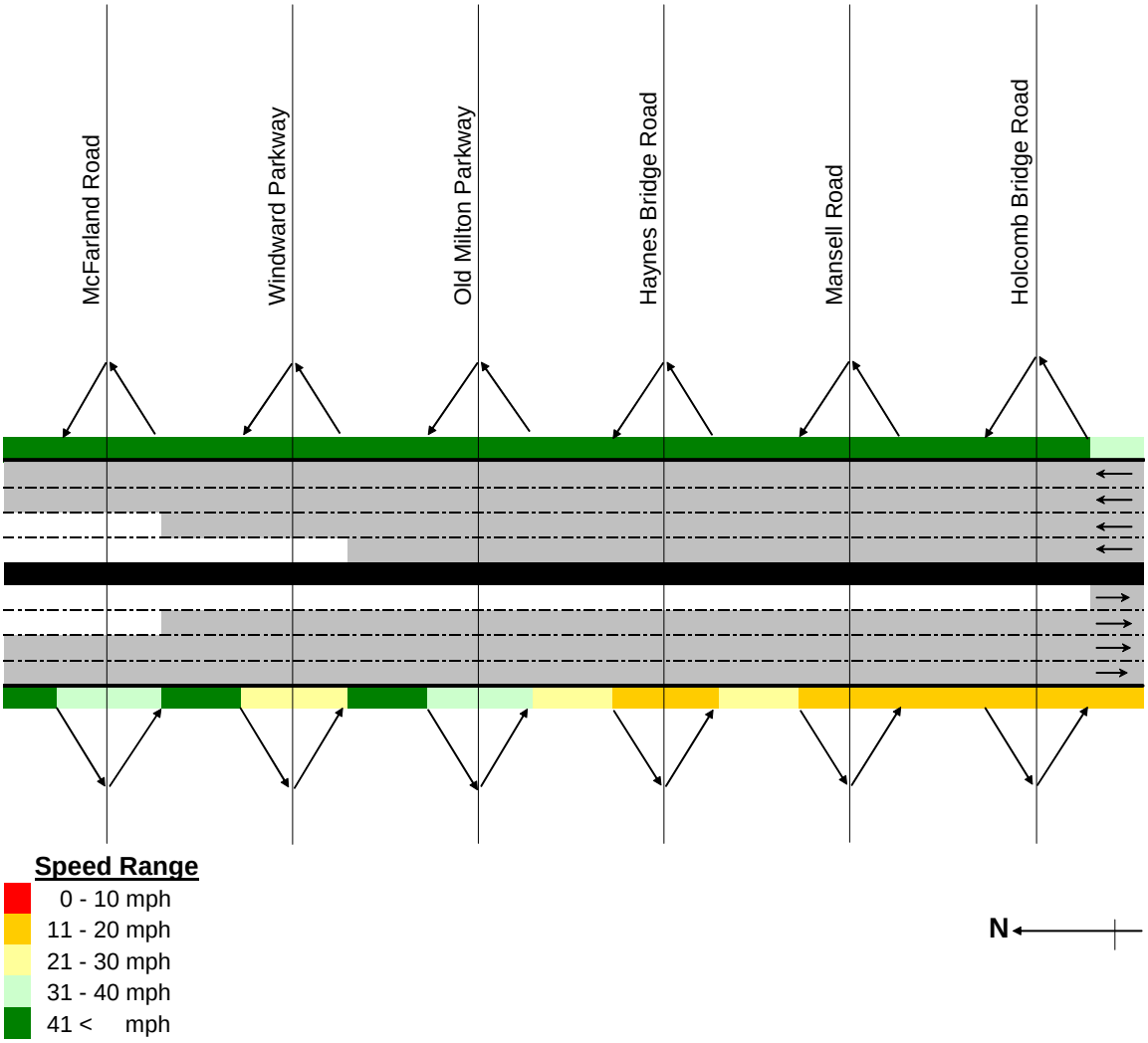
One of the important concepts that surfaced from the short-term assessment of GA 400 was the idea of using the modified shoulders of GA 400 as bus-only lanes for express bus service in the corridor. This short-term strategy would be replaced with more permanent HOV lanes in future years. Such bus operations have been used in other parts of the country (see Appendix R) with successful results. As a consequence of this Study finding, further work was undertaken to better understand the engineering and traffic operations requirements for bus-use of shoulders, including holding discussions with other transit properties, making a test run with a MARTA bus, taking core borings at selected locations along the shoulder, and further developing conceptual engineering plans.

These highway improvements are shown in Figures 7.3-2 through 7.3-4.

Figure 7.3-1 | Impact on Average Speed of Proposed Road Improvements on GA 400, Short-Term Timeframe

GA 400 Mainline
AM Peak Hour Average Speed (MPH)
Alternative: Year 2010 Short Term

Average Speed without Improvements



GA 400 Mainline
AM Peak Hour Average Speed (MPH)
Alternative: Year 2010 Short Term

Average Speed with Improvements

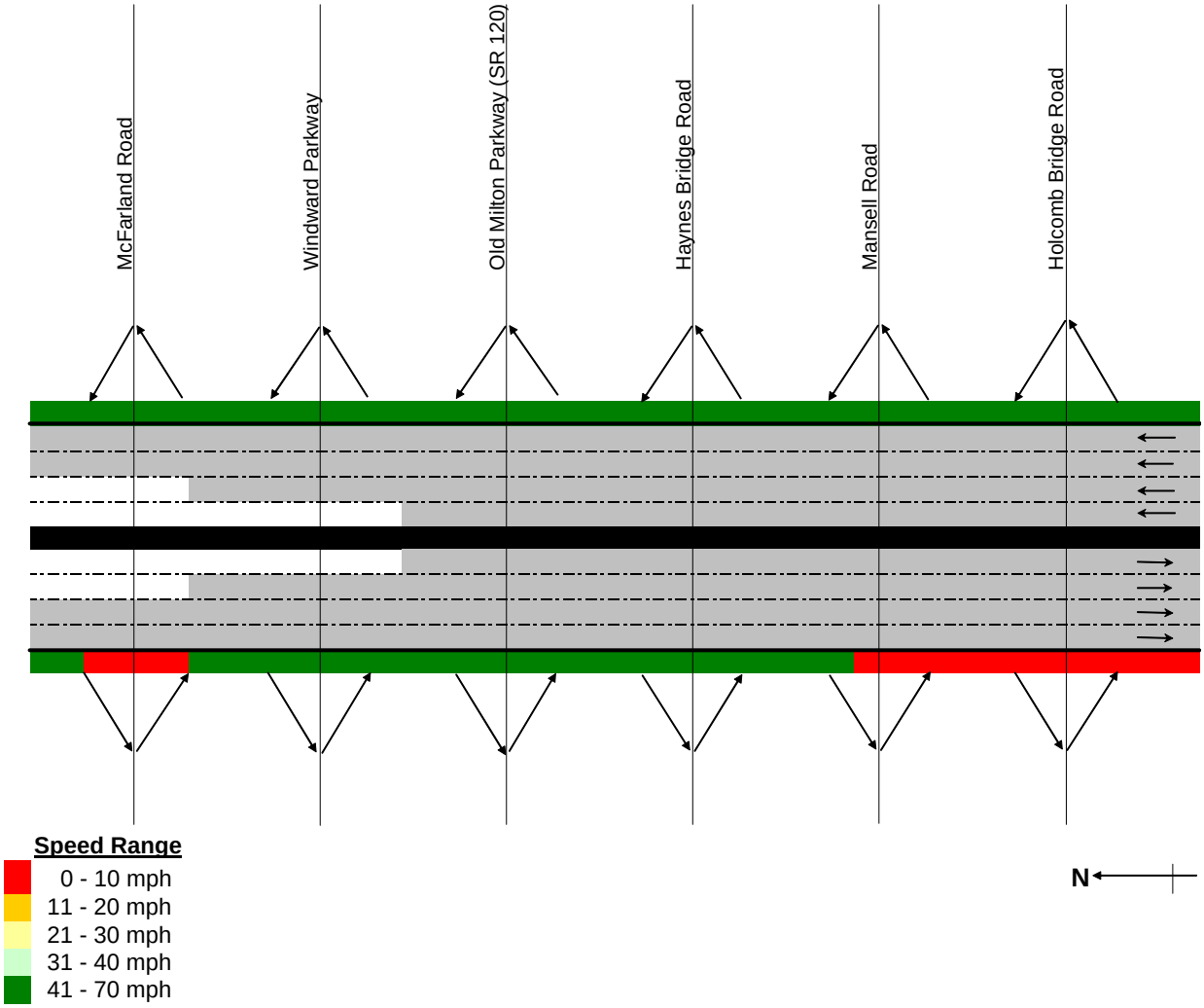
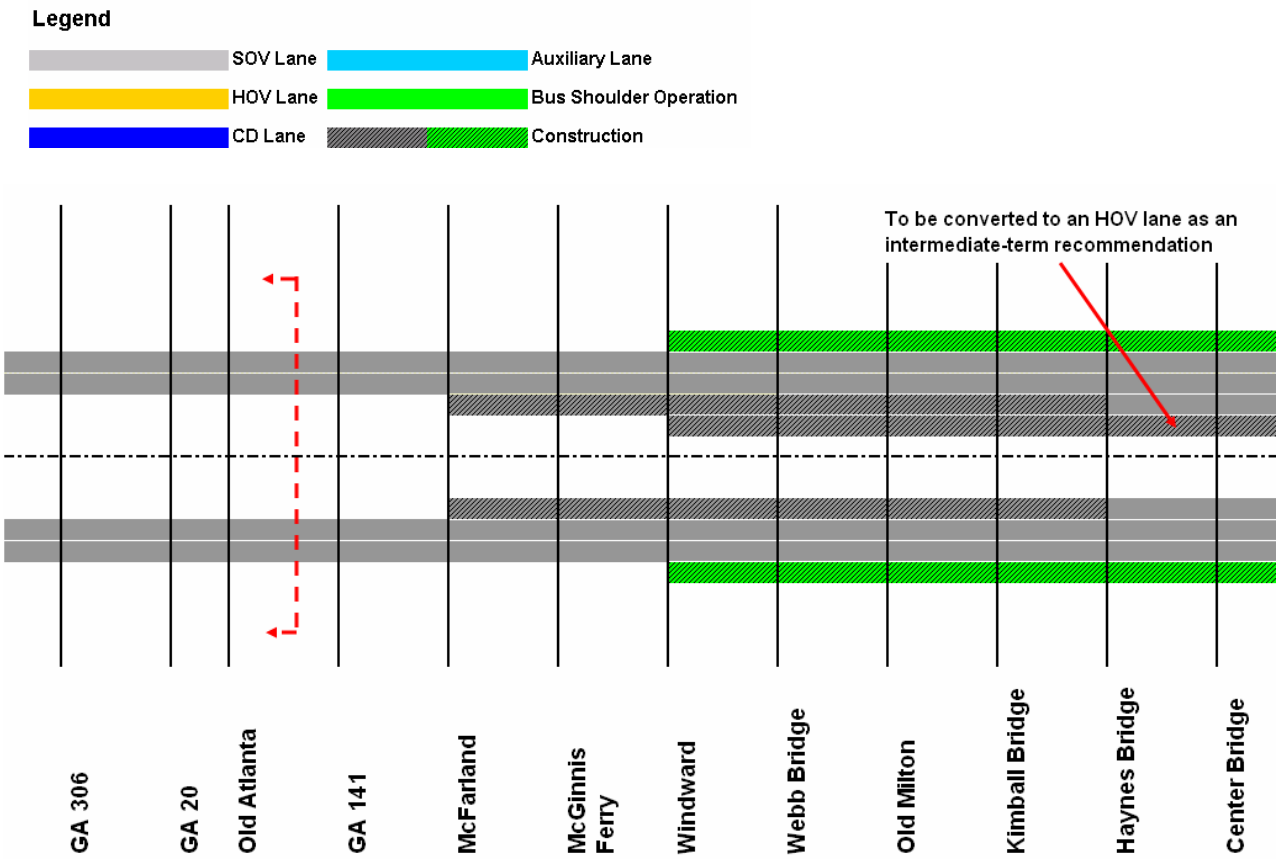
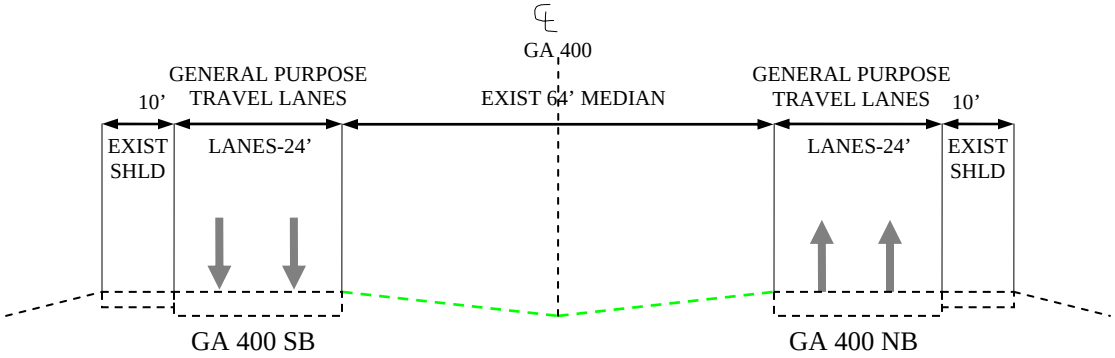


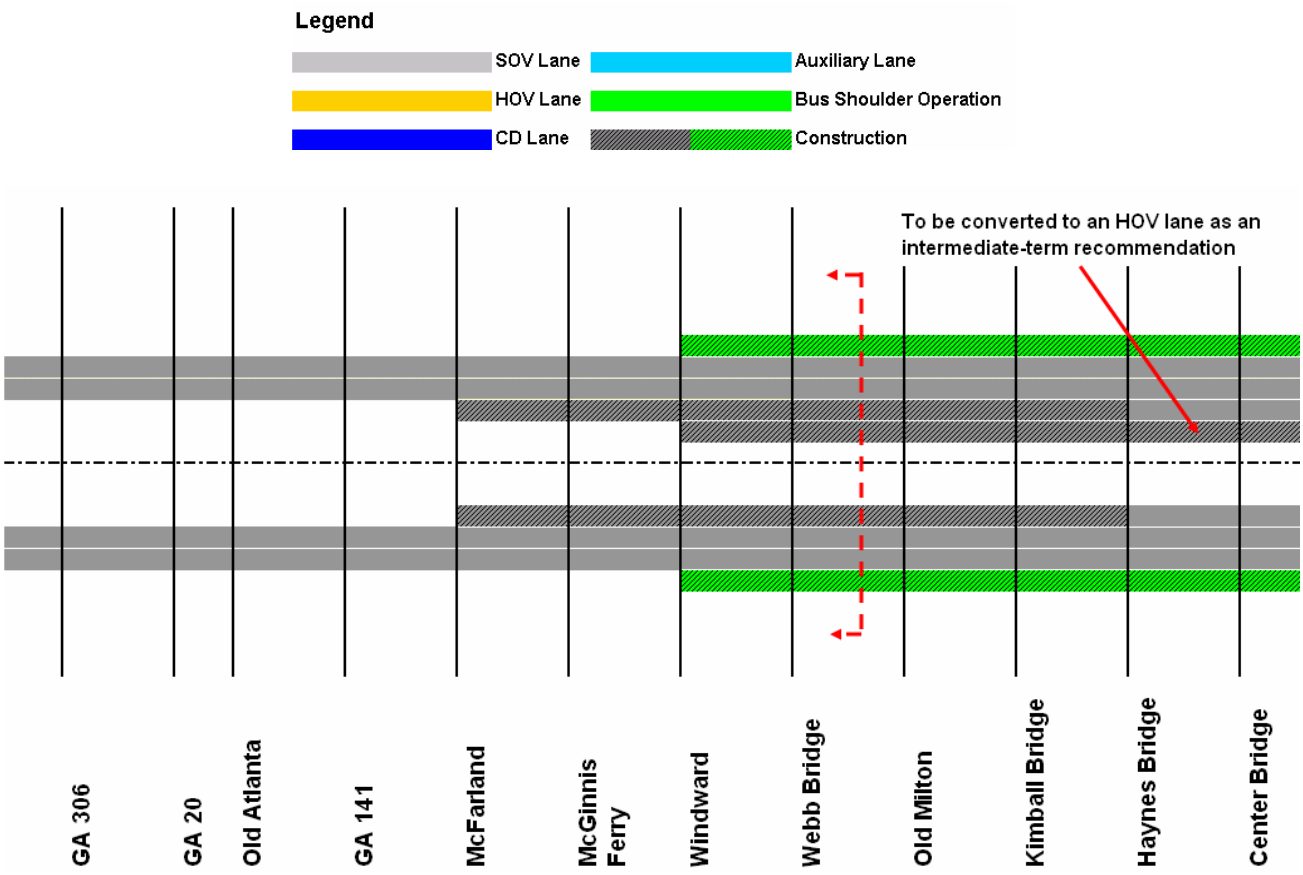
Figure 7.3-2 | Short-Term Improvement Recommendations: North Section of GA 400, with Cross Section near GA 141

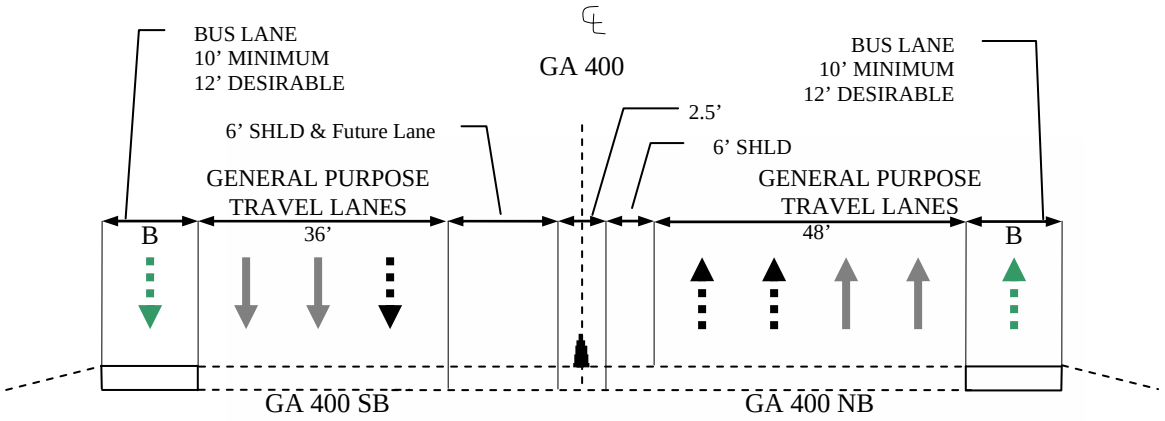




CROSS SECTION NEAR GA 141

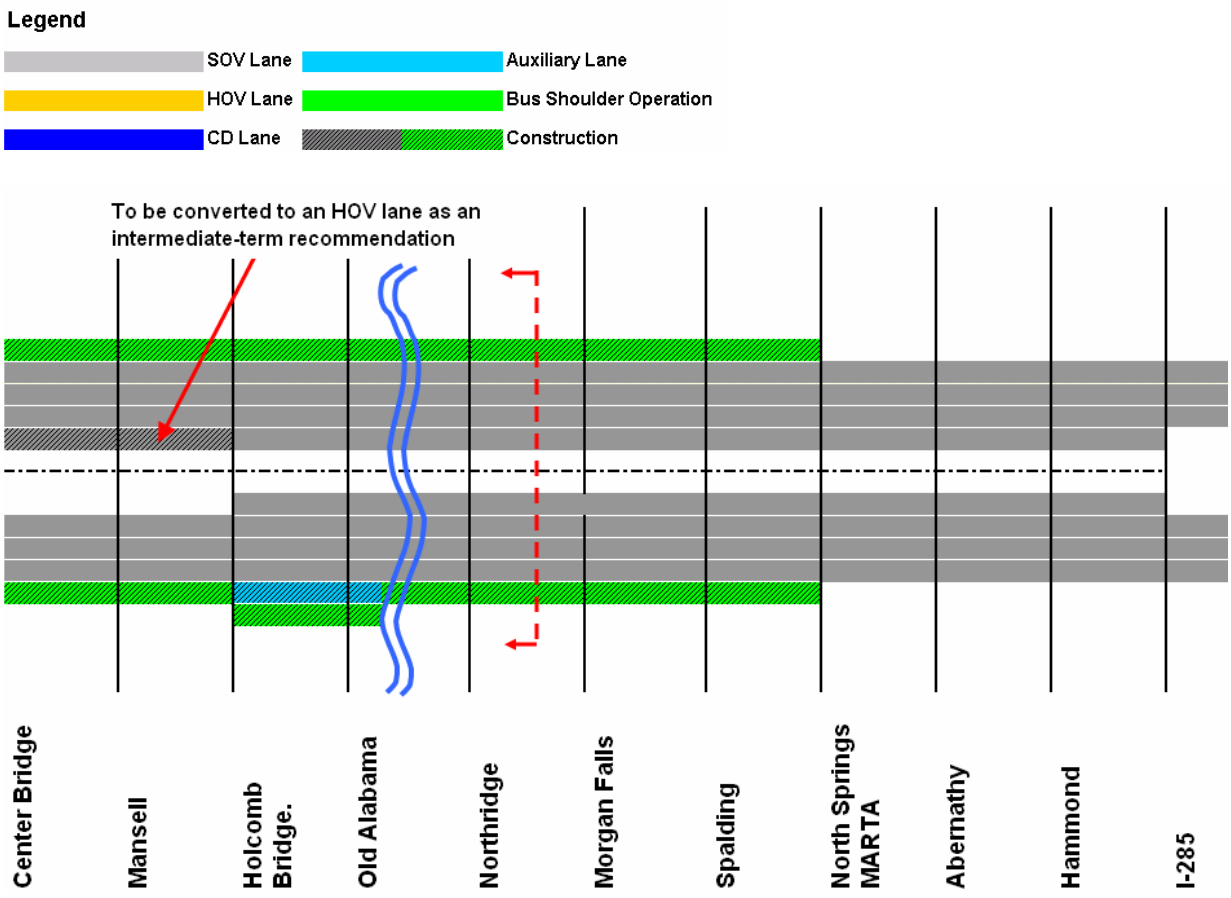
Figure 7.3-3 | Short-Term Improvement Recommendations:
North Section of GA 400, with Cross Section near Old Milton Parkway

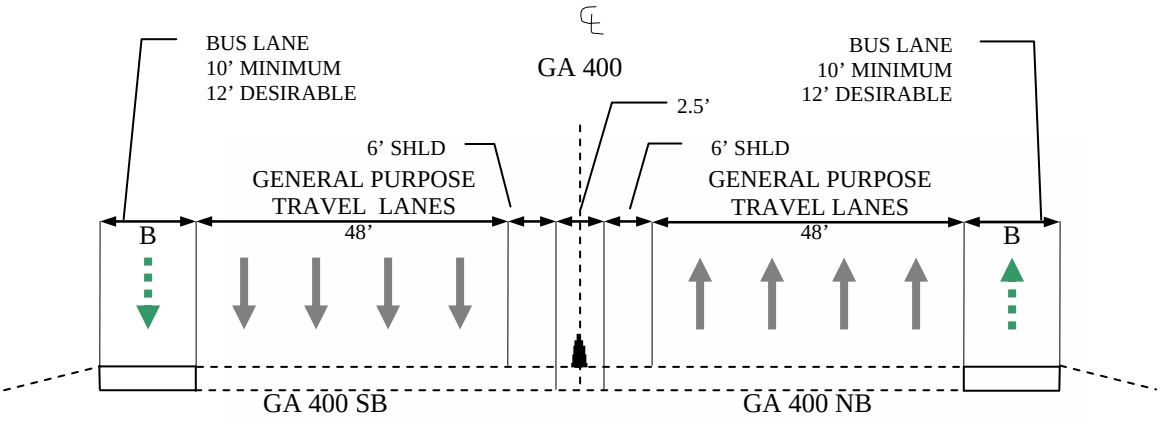




CROSS SECTION NEAR OLD MILTON PARKWAY
OUTSIDE BUS LANES & ADD'L GEN. PURP. LANE

Figure 7.3-4 | Short-Term Improvement Recommendations:
South Section of GA 400 with Cross Section near Morgan Falls





CROSS SECTION NEAR MORGAN FALLS ROAD
WITH BUS USE OF SHOULDERS

Transit Improvements

- Improve GA 400 shoulders from the North Springs MARTA station to Windward Parkway to allow for express bus operations
- Add five new express bus routes—SR 306, Cumming/Old Atlanta Road, McFarland Road, Doraville/East Roswell, and W. Roswell
- Purchase 27 new buses
- Build six park-and-ride lots with a total of 2,100 spaces
- Build a new maintenance/fueling/storage bus facility

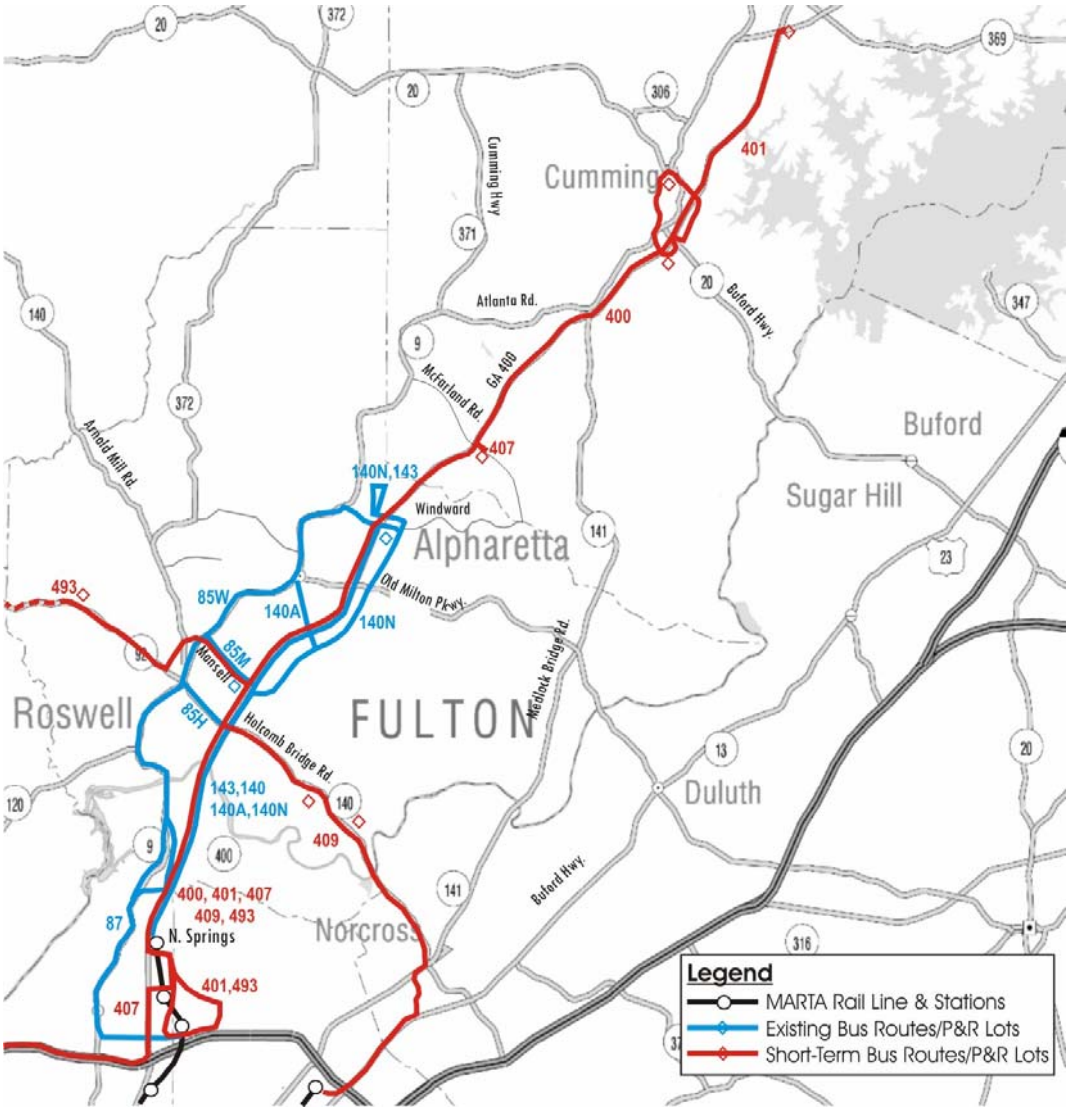
Table 7.3-2 and Figure 7.3-5 show the new bus routes that would be implemented as part of the short-term improvement program.

Table 7.3-2 Peak-Hour Bus Operations by GA 400 Segment, Short-Term Improvement Program

	Peak Buses Per Hour	Routes
I-285 to Abernathy Road	2	#407
North Springs Station to Northridge Road	25	#85, #87, #140, #143, #400, #401, #407, #409, #493
Northridge Road to Holcomb Bridge Road	18	#140, #143, #400, #401, #407, #409, #493
Holcomb Bridge Road to Mansell Road	17	#85H, #140, #143, #400, #401, #407, #493
Mansell Road to Windward Parkway	10	#143, #400, #401, #407
Windward Parkway to McFarland Road	6	#400, #401, #407
McFarland Road to Old Atlanta Road (SR 20)	4	#400, #401
Old Atlanta Road (SR 20) to SR 306	2	#401

The new park-and-ride lots will be sited along the corridor in locations offering convenient access to GA 400. It is anticipated that many of these lots would be the final pick-up point for passengers before accessing the bus shoulder lanes on GA 400.

Figure7.3-5 New Bus Routes in the GA 400 Corridor, Short-Term Improvement Program



Other Corridor Infrastructure Improvements

The Study identified three other road projects that were warranted and cost-effective in the short term if funds were available—widening SR 20 from GA 400 to Samples Road, widening SR 141 from the Fulton County line to SR 9, and widening State Bridge Road from Kimball Bridge Road to SR 141. In addition, the Study recommends an investment of $20 million to improve intersections in the corridor on major arterials that connect to GA 400. A $2 million investment is also recommended to improve pedestrian facilities, many focused on improving access to transit stops. See Appendix R for further details.

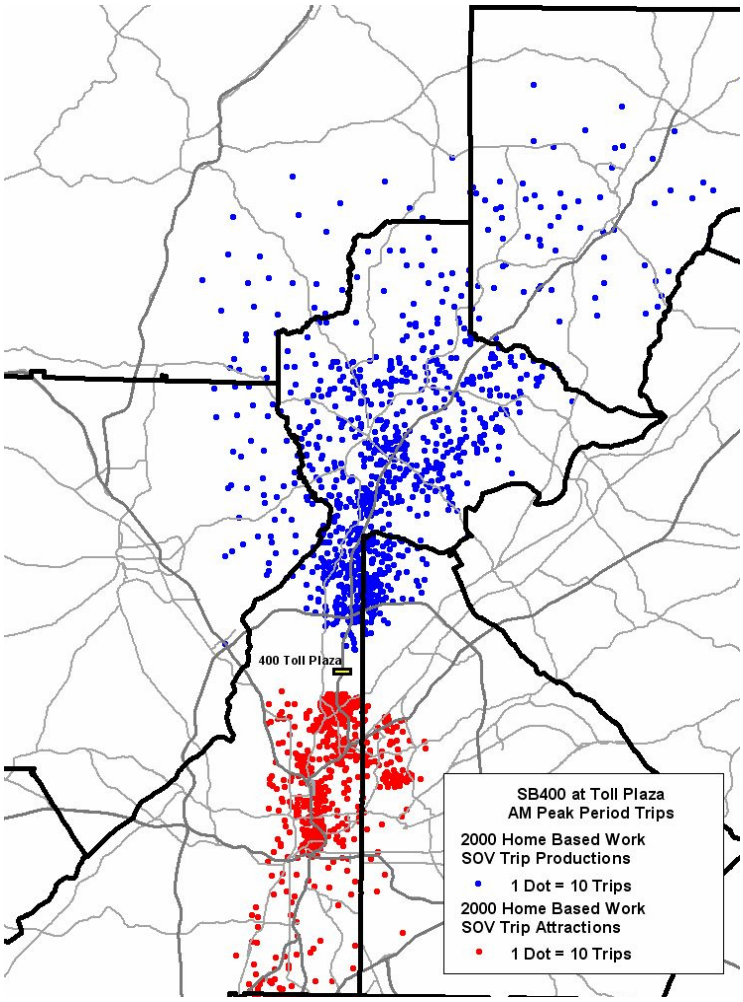
Travel Demand Management (TDM) Strategies

Travel demand management strategies focus on reducing the demand for travel during heavily congested times of day. Strategies could include such things as implementing alternative work schedules, using telecommunications as a substitute for travel, incorporating the true cost of traveling by automobile into the price faced by automobile users (e.g., by charging to park), and encouraging the use of car or van pools.

Many TDM strategies are aimed at the work trip, a major contributor to congestion during peak periods. Thus, the successful implementation of commute trip-oriented TDM strategies depends to a large extent on the participation of employers or transportation management associations (TMAs) that work with member employers in fostering more effective transportation options for employees at TMA sites.

The GA 400 Corridor Analysis strongly endorses the concept of TDM applied at major employment activity centers in the corridor or at sites connected to GA 400 through employee use. Figure 7.3-6, for example, shows the trips originating in the NSAS Area destined to south of GA 400 that use the toll road. Encouraging employers even at sites largely outside the GA 400 Corridor to reduce single-occupant trips by their employees could make an important contribution to improving the performance of GA 400.

Figure 7.3-6 | Origins and Destinations of Southbound GA 400 Toll Road Traffic



Some of the travel demand options identified for consideration in the GA 400 Corridor include:

- Intercept parking/transit circulators in the Perimeter Center area
- Employer-based trip reduction programs using TMAs as brokers
- Expansion of existing car and van pool initiatives
- Implementation of telecommuting programs, where appropriate
- Implementation of alternative work hour programs, where appropriate
- Pricing programs for cars, dependent on space utilization
- Pricing the use of HOV lanes for non-HOV vehicles (called "managed lanes")

Land Use Policies

Changes in land use policies could have a major impact on the way land is developed and thus on overall future travel patterns. However, in the timeframe of this short-term improvement program, it is not likely that such changes would occur. The intent of the GA 400 Corridor Analysis is to raise the policy options that should be considered by local, regional and state governments. These options consist of two major components listed below—the adoption of policies that would provide a better linkage between land development and transportation system performance, and the adoption of implementing mechanisms (e.g., site plan review or zoning ordinances) that could result in changes to land development trends.

Recommended Land Use Policies

- Avoid locating high traffic generators next to one another without appropriate traffic mitigation
- Encourage employers to promote trip arrivals (person and freight) in off-peak times as much as possible
- Provide incentives to developers to locate near transit centers (e.g., allow higher densities)
- Evaluate proposed developments with consideration to existing and committed transportation infrastructure
- Coordinate with adjacent jurisdictions to provide integrated development decisions
- Encourage affordable housing near employment centers
- Encourage walkable and bicycle-friendly developments

Recommended Implementation Mechanisms

- Review site plans with respect to safety and access management
- Consider coordinated access management along streets having adjacent developments
- Require internal pedestrian and auto connections between adjacent developments
- Improve transit access by improving pedestrian amenities and transit stops

A more detailed description of land use strategies and tools that could be considered in the NSA Study Area is found in Appendix Q.

7.4 IMPROVEMENTS IN THE GA 400 CORRIDOR: INTERMEDIATE TERM (10-15 YEARS)

The recommended improvements in the GA 400 Corridor over the following 10 to 15 years are aimed primarily at fostering high occupancy vehicle (HOV) use in the GA 400 Corridor. The primary motivation of the investments is to develop HOV lanes as soon as possible so as to provide important time savings to those using transit and those who rideshare. The major strategy for doing this is to convert the median lane of GA 400 in each direction to concurrent HOV use and to turn the bus lanes on shoulders implemented during the short-term improvement program to general purpose lanes. Thus, the number of general purpose lanes available is the same before and after the conversion to HOV lane operations.

> ***An analysis of transit ridership with the MARTA north line extended to Windward Parkway versus a bus rapid transit system using GA 400 HOV lanes showed that the BRT system was more cost-effective.***

One of the important questions examined as part of the Study was whether an extension of the MARTA north line to Windward Parkway was the most cost-effective strategy for encouraging increased transit ridership. An analysis of ridership on a MARTA rail line extension to Windward Parkway (plus feeder bus services) as compared to a system of express bus routes using a dedicated HOV lane on GA 400, known as bus rapid transit (BRT), showed that both types of service strategies result in approximately the same number of transit riders in the corridor at a point just north of I-285 (about 30,000 trips per day). At points further north in the corridor the BRT strategy was projected to carry substantially more trips as illustrated by Figure 7.4-1. Given the higher cost of extending the MARTA line, HOV/BRT service is recommended as the more cost-effective transit strategy in the corridor.

The southern end of the HOV lane at the I-285/GA 400 interchange poses significant operational problems. Without major reconstruction of the I-285/GA 400 interchange, it is very difficult to carry the HOV lane through to the tollway south of the interchange. Also, there appears to be less need for HOV lanes through the I-285 interchange, as only about 40 to 50 percent of the AM south bound traffic north of I-285 continues south through the interchange. The balance of the traffic exits onto I-285 in roughly equal amounts to the east and to the west. Thus, the recommended HOV strategy at this location is to connect the southbound median HOV lane to the collector-distributor lanes that are proposed in the ARC 2025 RTP (see Figure 7.4-2, Detail 1).

Figure 7.4-1 Corridor Transit Riders Forecast at Several Points in The GA 400 Corridor

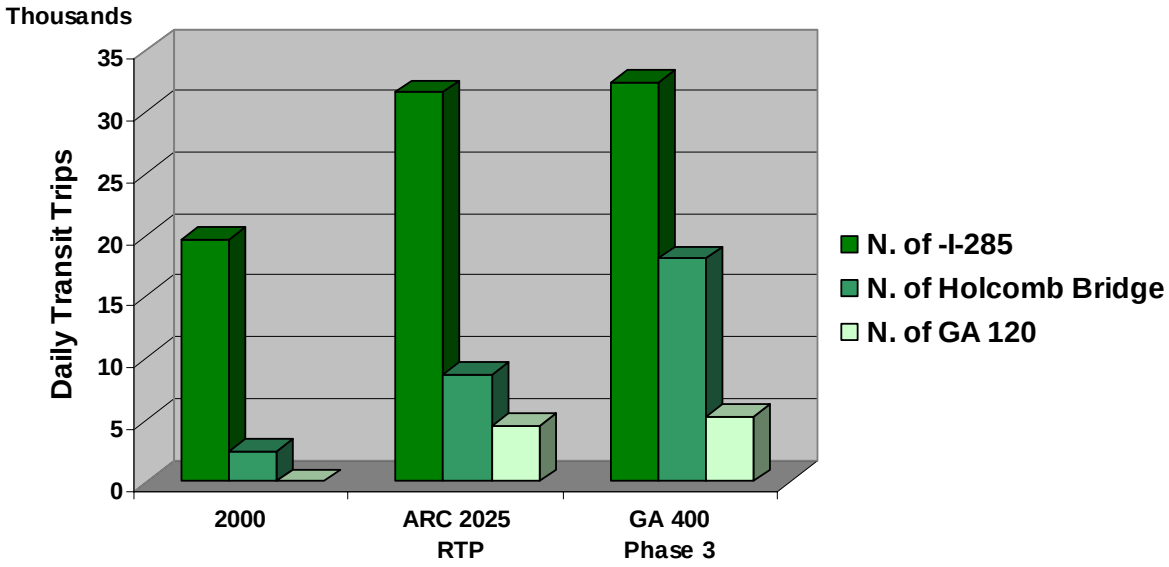
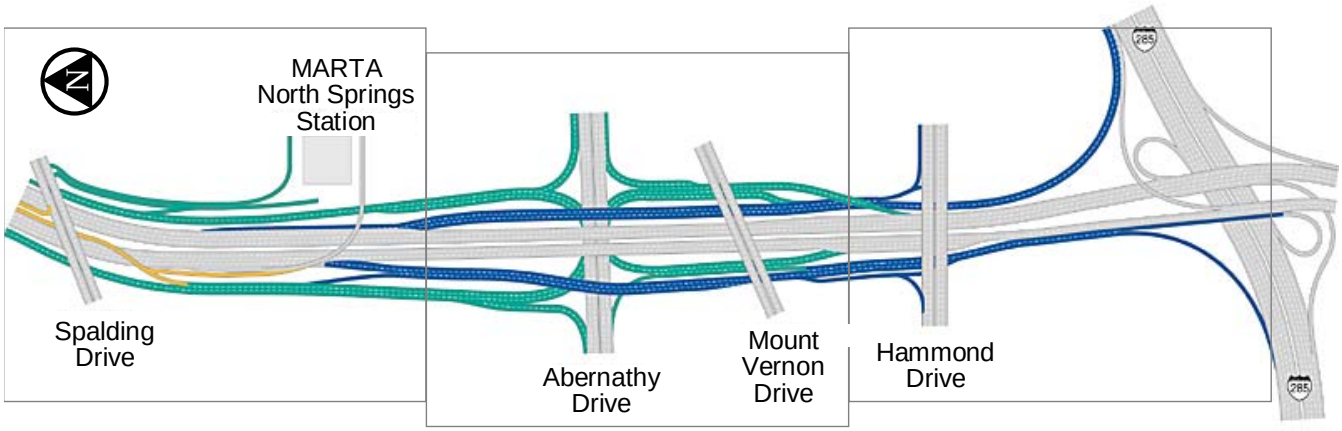


Figure 7.4-2 Proposed HOV Connection to Collector-Distributor System at GA 400/I-285 and Connection to MARTA North Springs



Detail 1 Detail 2 Detail 3

Through the use of such a "flyover ramp," GA 400 southbound HOVs going east- or westbound on I-285 would have direct access to these ramps, thus providing better movement for two-thirds of the trips going through this interchange.

Drivers going southbound in the HOV lane on GA 400, proceeding through the I-285/GA 400 interchange toward the toll, would have to merge with general purpose traffic just south of Spalding Drive. The northbound HOV lane would not begin until Spalding Drive.

The recommended improvements over the next ten to 15 years are listed below and illustrated in Figures 7.4-3 through 7.4-5.

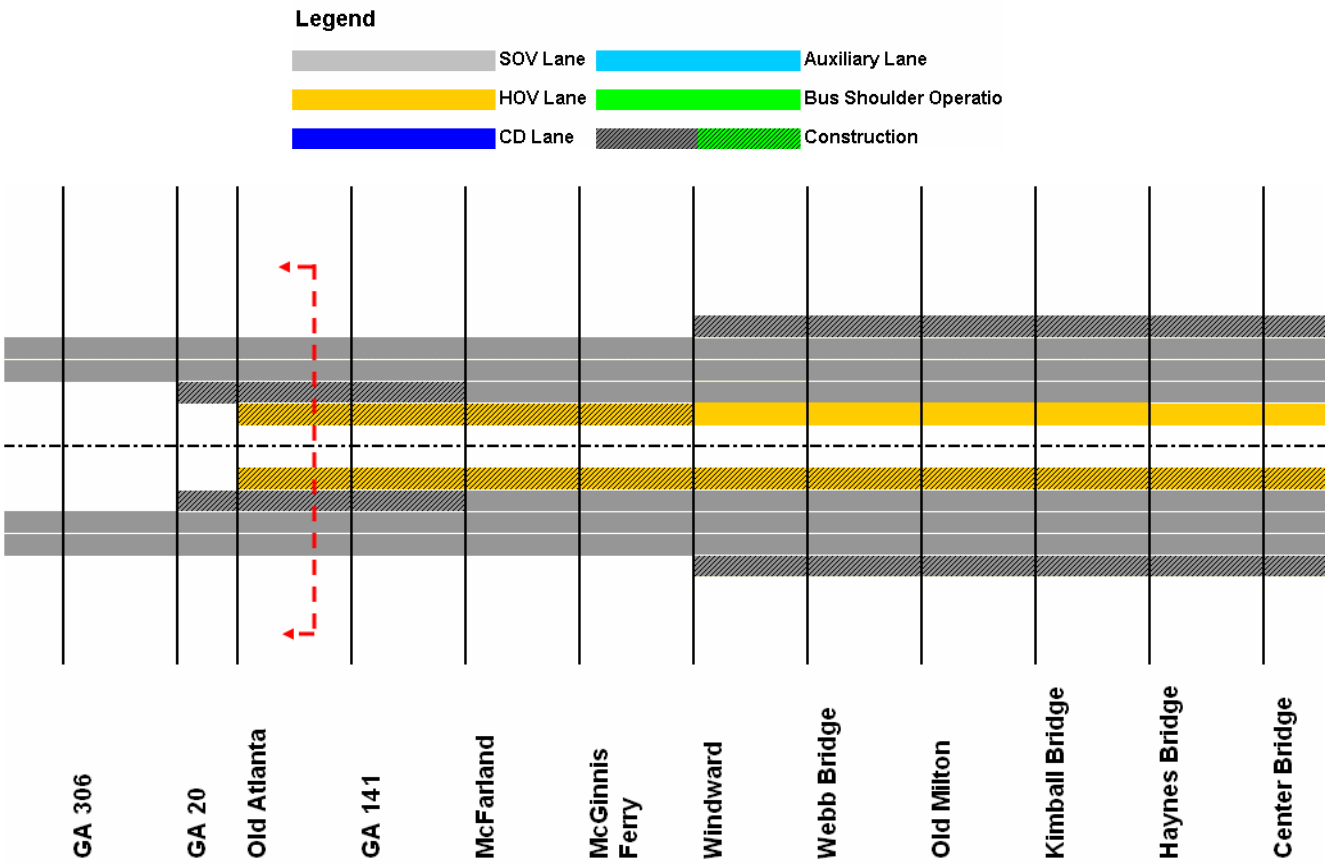
HOV Improvements

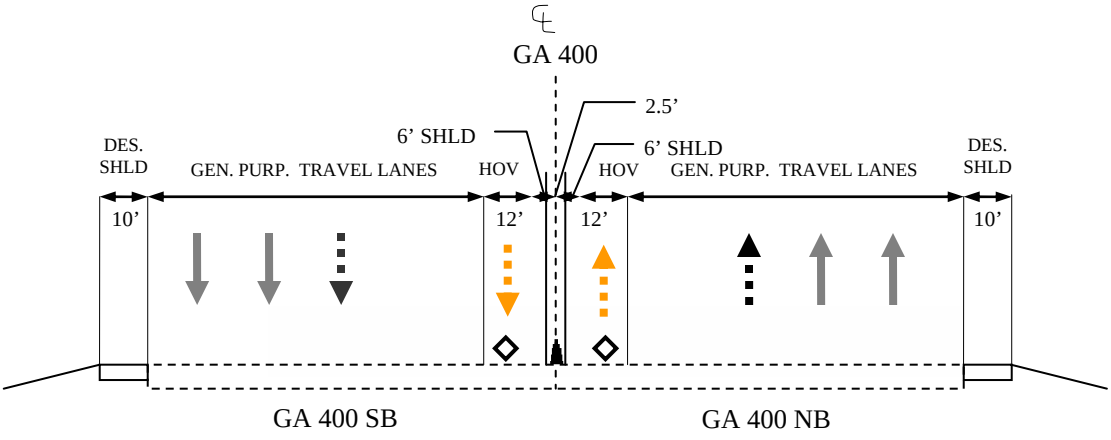
- Convert center general purpose lanes from Spalding Drive to Windward Parkway to HOV use
- Build concurrent HOV lanes in median from Windward Parkway to Old Atlanta Road
- Build flyover ramp from southbound HOV at Spalding Drive to North Springs MARTA station ramp and collector-distributor system
- Build access road from North Springs MARTA station to Spalding Drive and HOV on-ramp in northbound direction at Spalding Drive

Highway Improvements

- Build general purpose lane in median in both directions from McFarland Road to SR 20
- Convert and upgrade shoulders to a general purpose lane in both directions from North Springs MARTA station on-ramp to Windward Parkway
- Build southbound lane from Holcomb Bridge Road to Windward Parkway (companion lane to northbound lane added in short-term recommendations)
- Extend Holcomb Bridge Road southbound ramp across the Chattahoochee River to the collector distributor system near Northridge Parkway. Widening the Chattahoochee River bridge will require environmental evaluation when this recommendation goes forward into project development.
- Build collector-distributor system from I-285 to north of Spalding Drive.

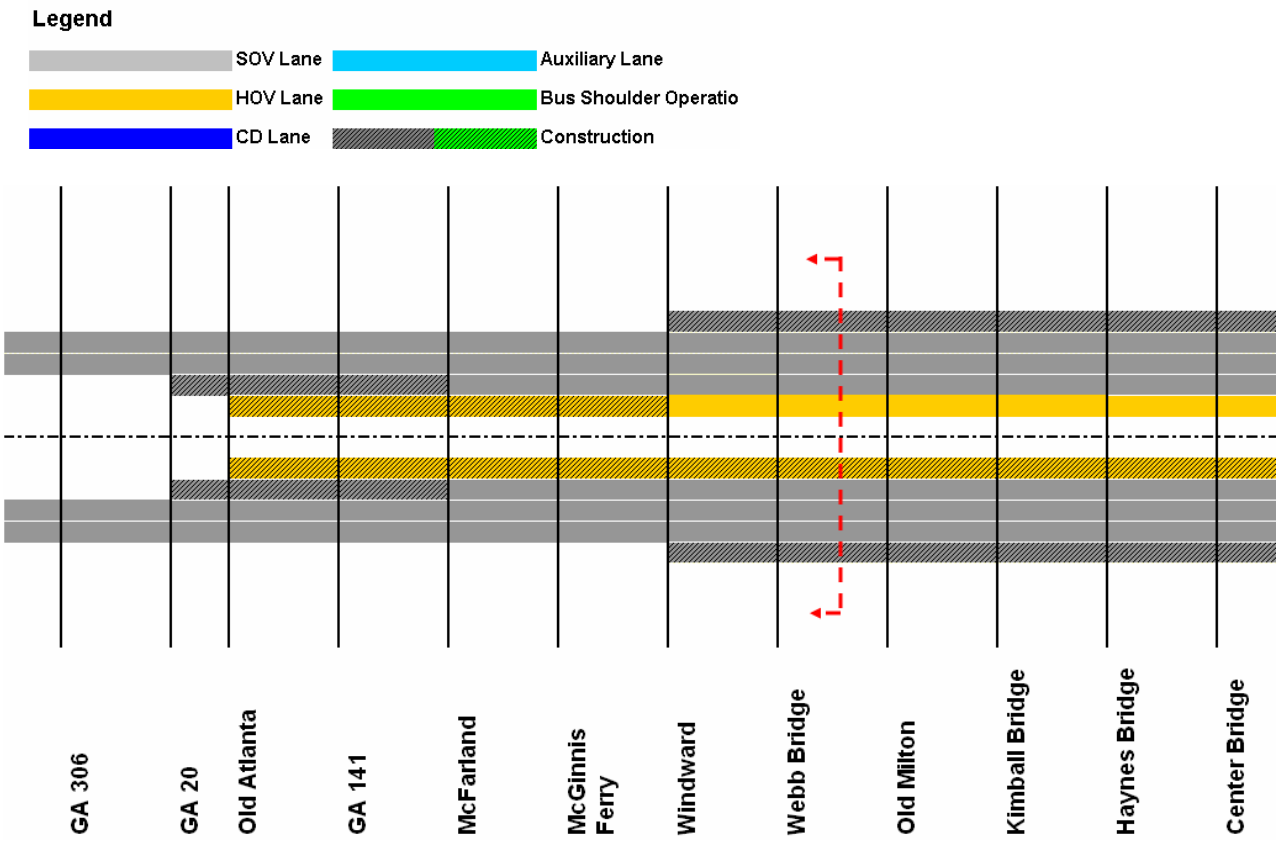
Figure 7.4-3 | Intermediate-Term Improvement Recommendations: North Section of GA 400, with Cross Section near GA 141

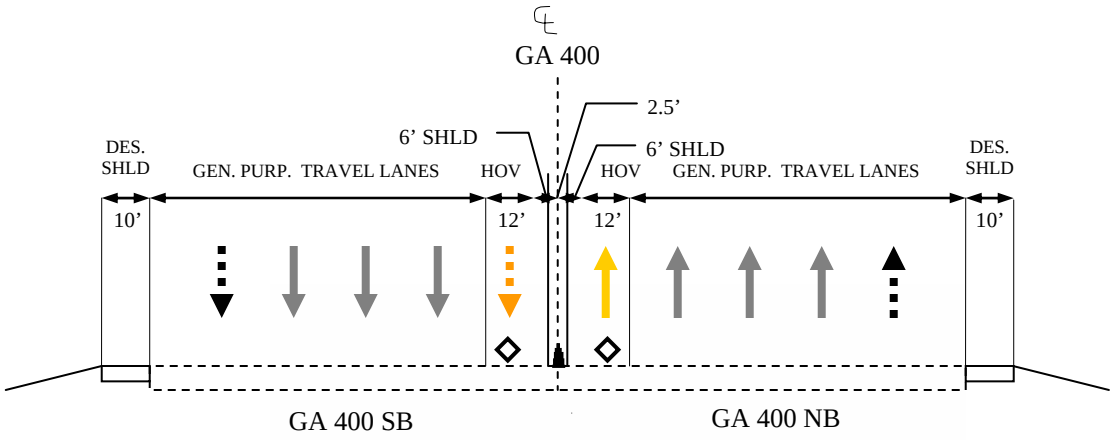




CROSS SECTION NEAR GA 141

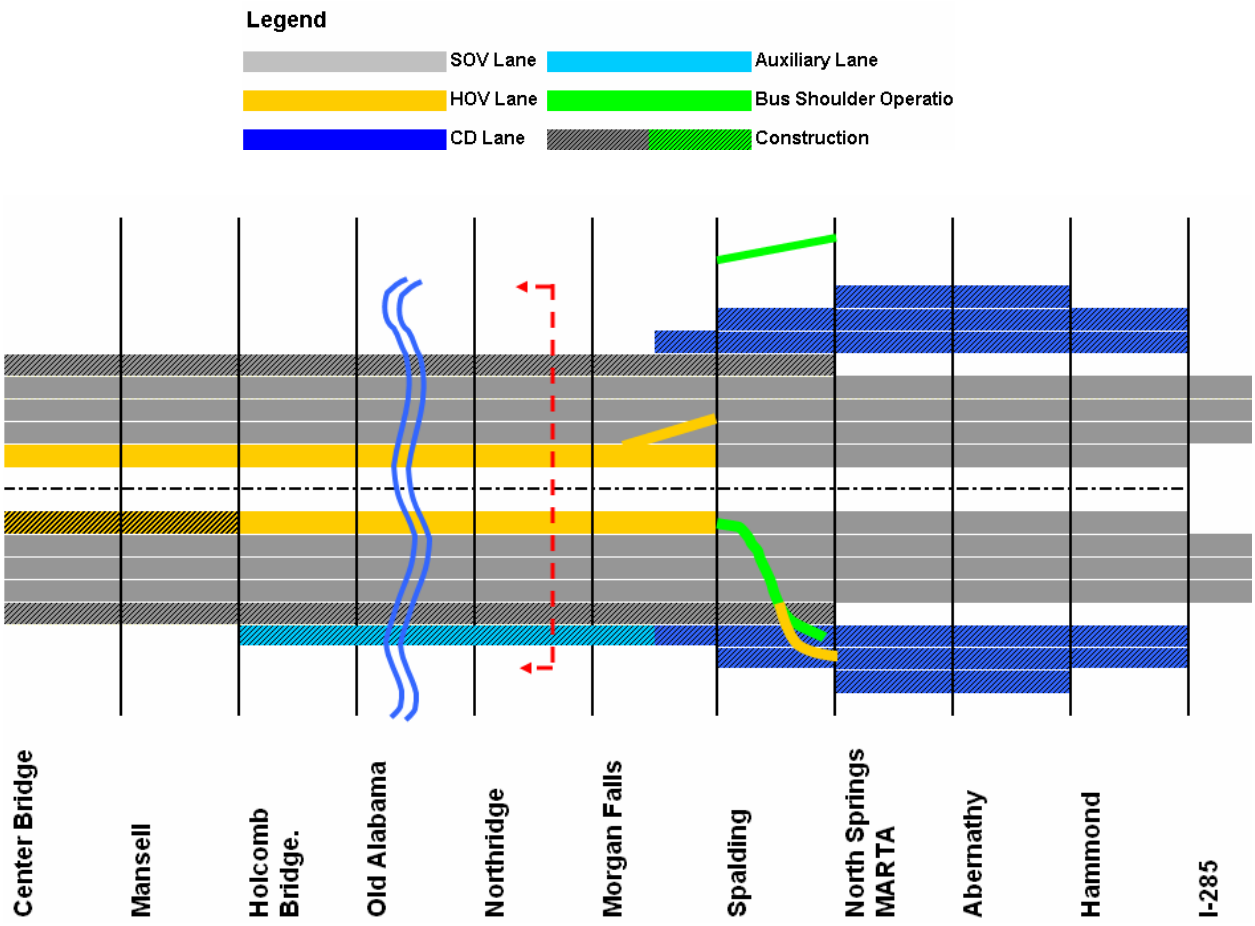
Figure 7.4-4 Intermediate-Term Improvement Recommendations: North Section of GA 400, with Cross Section near Old Milton Parkway

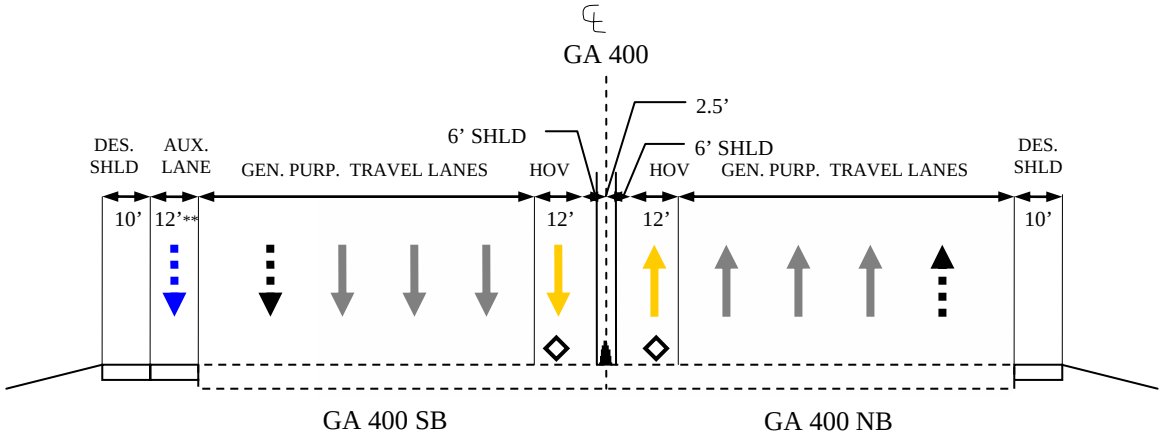




CROSS SECTION NEAR
OLD MILTON PARKWAY

Figure 7.4-5 | Intermediate-Term Improvement Recommendations: South Section of GA 400, with Cross Section near Morgan Falls





CROSS SECTION NEAR MORGAN FALLS ROAD

Two options were examined for the design of the HOV lane—a barrier-separated cross section and a concurrent-lane design as currently used on I-85 North. The Georgia DOT has established a policy that HOV lanes should be barrier-separated, and on major freeways be designed with two lanes in each direction. The GA 400 Corridor Analysis showed that only one HOV lane in each direction was needed. The Analysis also determined that constructing a four-lane HOV design south of Holcomb Bridge Road would be very expensive given the costs of needed right-of-way and the reconstruction of existing bridges over GA 400, along with causing significant community impact. In addition, demand analysis showed that the barrier-separated HOV would serve a smaller number of trips (approximately 30percent fewer) because the design would discourage use of the HOV lane for shorter trips. Table 7.4-1 shows the predicted on and off volume for the southbound direction in the a.m. peak period by interchange.

Table 7.4-1 **GA 400 HOV On and Off Ramp Volumes, Barrier Separated and Concurrent Lanes, Southbound**

	SB Concurrent HOV			NB Concurrent HOV		
	On	**Off**	**HOV Lane**	**On**	**Off**	**HOV Lane**
Old Atlanta Road	1,130	-	1,130	1,140	-	1,140
McFarland Road	70	-	1,200	-	-	1,140
McGinnis Ferry Road	460	70	1,590	610	70	1,680
Windward Parkway	280	50	1,820	-	-	1,680
Webb Bridge Road	150	180	1,790	320	200	1,800
SR 120	120	90	1,820	-	-	1,800
Kimball Bridge Road	230	130	1,920	260	170	1,890
Haynes Bridge Road	190	120	1,990	-	-	1,890
Center Bridge Road	300	70	2,220	500	210	2,180
Mansell Road	350	220	2,350	-	-	2,180
Holcomb Bridge	660	140	2,870	-	-	2,180
Old Alabama Road	560	260	3,170	1,100	210	3,070
Dunwoody Place	390	260	3,300	-	-	3,070
Morgan Falls River	-	160	3,140	-	-	3,070
Spalding Drive	-	450	2,690	-	540	2,530
Abernathy Road	310	260	2,740	-	-	2,530
Hammond Drive	-	110	2,630	-	-	2,530
I – 285	-	2,040	590	-	1,980	550
GA 400 SB		590	-		550	-
TOTAL	**5,200**	**5,200**		**3,390**	**3,930**	

The costs for barrier-separated and concurrent HOV lanes were estimated as shown in Table 7.4-2.

Table 7.4-2 **Costs for Concurrent Lane and Barrier-Separated HOV lanes**

	Concurrent Lane	Barrier-Separated
North Springs MARTA to Holcomb Bridge Road	$38,500,000	$95,100,000
Holcomb Bridge Road to Haynes Bridge Road	$14,900,000	$49,300,000
Haynes Bridge Road to McFarland Road	$17,100,000	$84,100,000
Right-of-Way	$13,750,000	$37,250,000
Total	**$84,250,000**	**$265,750,000**

Barrier separation on HOV lanes is considered to be safer (although relative safety statistics between barrier- and non-barrier-separated HOV lanes have been difficult to find), and easier to enforce. However, given the difference in costs, and the time required to reconstruct the bridges over GA 400, the Study recommends an HOV design that consists of one concurrent lane in each direction.

The analysis of traffic operations at this location suggests that the collector/distributor system is the most important investment in this part of the corridor for improving traffic flow. If this system is not put in place, the HOV lanes will not work as well. The collector/distributor system is a key element in the success of the proposed HOV facility in the GA 400 Corridor.

Transit Improvements

The proposed transit lines in the GA 400 Corridor are shown in Table 7.4-3. In general, the policies followed in developing these transit lines was to:

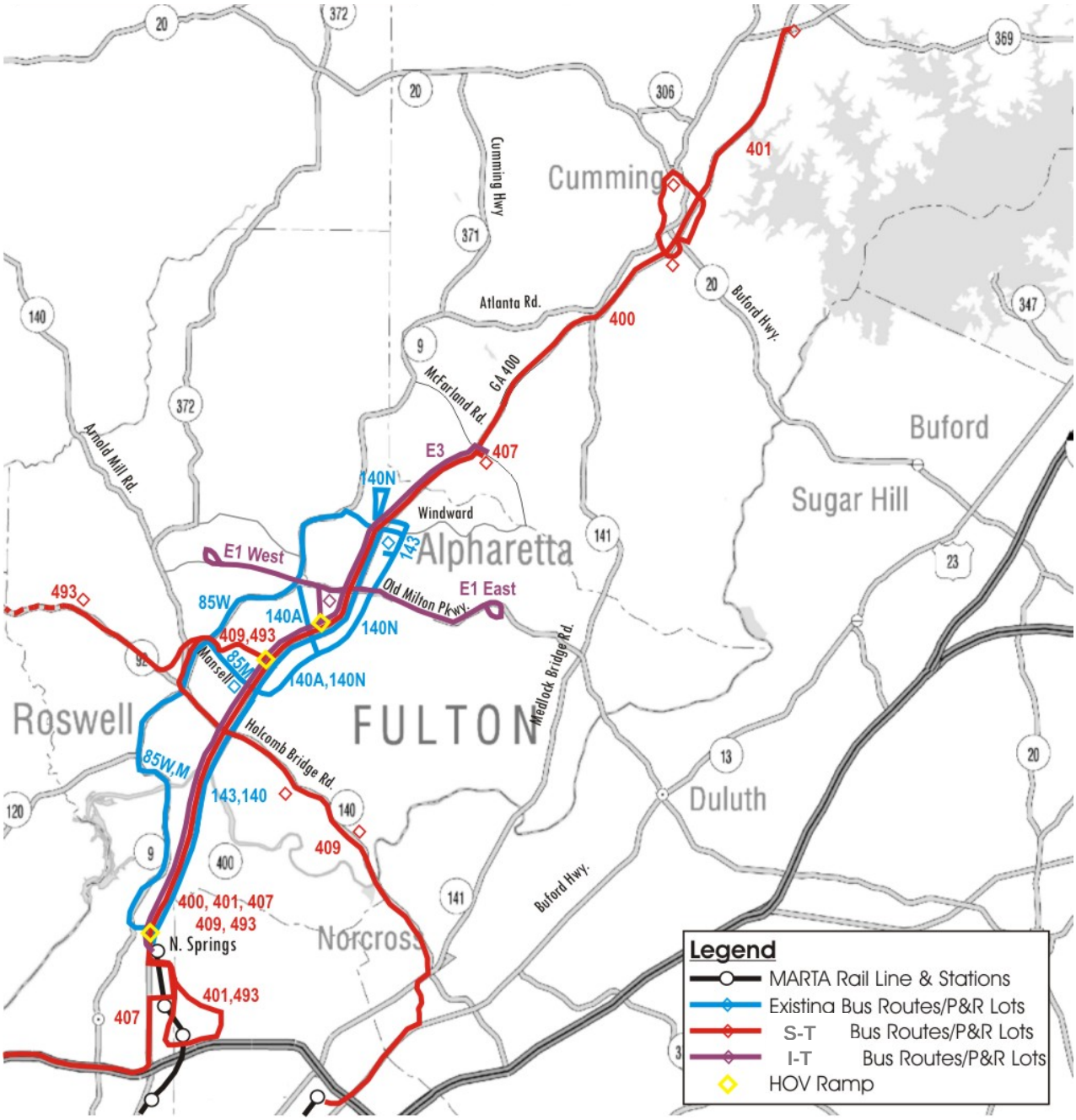
- Shift express bus service in corridor to new concurrent HOV lanes from Spalding Drive to Old Alabama Road
- Increase service frequencies as justified by ridership

The proposed bus routes for the intermediate improvement program are shown in Figure 7.4-6.

Table 7.4-3 **GA 400 Proposed Transit Lines, Intermediate-Term Improvement Program**

GA 400 CORRIDOR INTERMEDIATE – TERM BUS ROUTES OPERATING ON GA 400											
Route	**From**	**To**	**Time (min.)**	**Dist. (mi.)**	**Frequency of Service Peak**	**Base**	**Evening**	**One-Way Trips**	**Pk Buses Req'd**	**Annual Revenue Bus-Mi.**	**Bus-Hrs.**
Prior Investments											
85 W	Windward P-R via SR 9	North Springs Station	54	18.4	30	60	60	54			
85 M	Mansell P-R via Mansell Road	North Springs Station	34	11.6	30	60	60	58			
140	Mansell P-R	North Springs Station	15	8.0	15	30	30	17			
140 N	N Alpharetta-North Point Mall	Mansell P-R	30	12.2	30	60	60	52			
140 A	Downtown Alph-North Point Mall	Mansell P-R	16	4.6	60	60	60	33			
143	Windward P-R	North Springs Station	25	15.1	15	60	n/a	110			
GTRA 400	Cumming-Old Atlanta P-R	North Springs Station	50	25.6	30	60	n/a	32			
GTRA 401	SR 306 P-R	North Springs-Perimeter Ctr.	65	34.5	30	n/a	n/a	10			
GTRA 407	McFarland P-R	North Springs-Cumberland	65	27.0	30	n/a	n/a	10			
GTRA 409	North Springs Station	Doraville Station	58	19.7	30	60	60	54			
GTRA 493	W Roswell P-R	North Springs-Perimeter Ctr.	55	17.2	30	60	n/a	36			
Intermediate – Term Investments			**Prior Investment Total Trips Provided:**					**466**			
E1 East	SR 120/Jones Br-Old Milton P-R	North Springs Station	45	15.4	30	60	n/a	36	4	142,000	9,200
E1 West	SR 140/SR 372-Old Milton P-R	North Springs Station	50	17.3	30	60	n/a	36	4	159,000	9,200
E3	McFarland P-R	N. Point Mall-North Springs Station	40	17.1	30	60	n/a	32	3	140,000	6,100
		Intermediate-Term Bus Investment Operating Statistics:						**104**	**11**	**441,000**	**24,500**
Capital Costs: Annual O&M Costs:			Intermedaite Term $4,233,000 $1,771,000		*Fleet Buses Required =*				*13*		

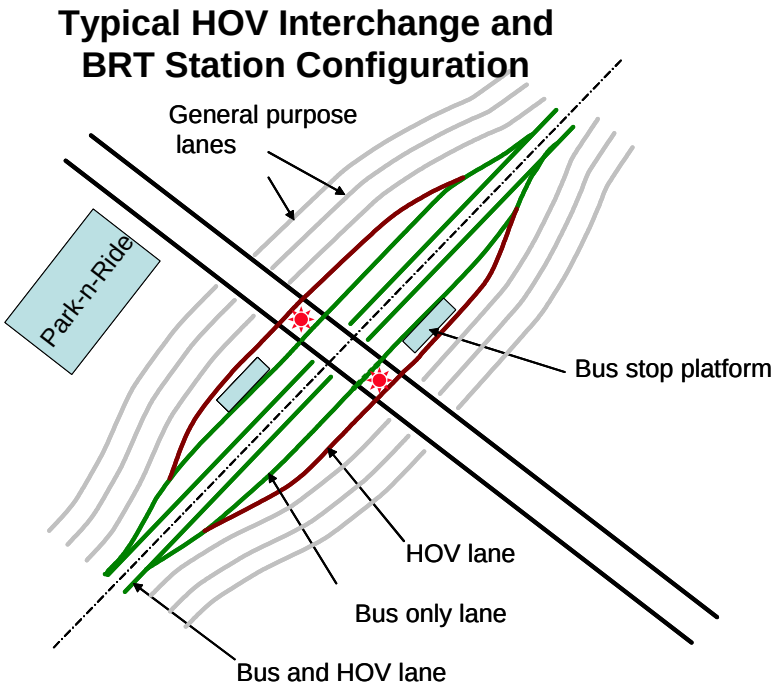
Figure 7.4-6 | Proposed Bus Routes, Intermediate Improvement Program



7.5 IMPROVEMENTS IN THE GA 400 CORRIDOR: LONG TERM (15-25 YEARS)

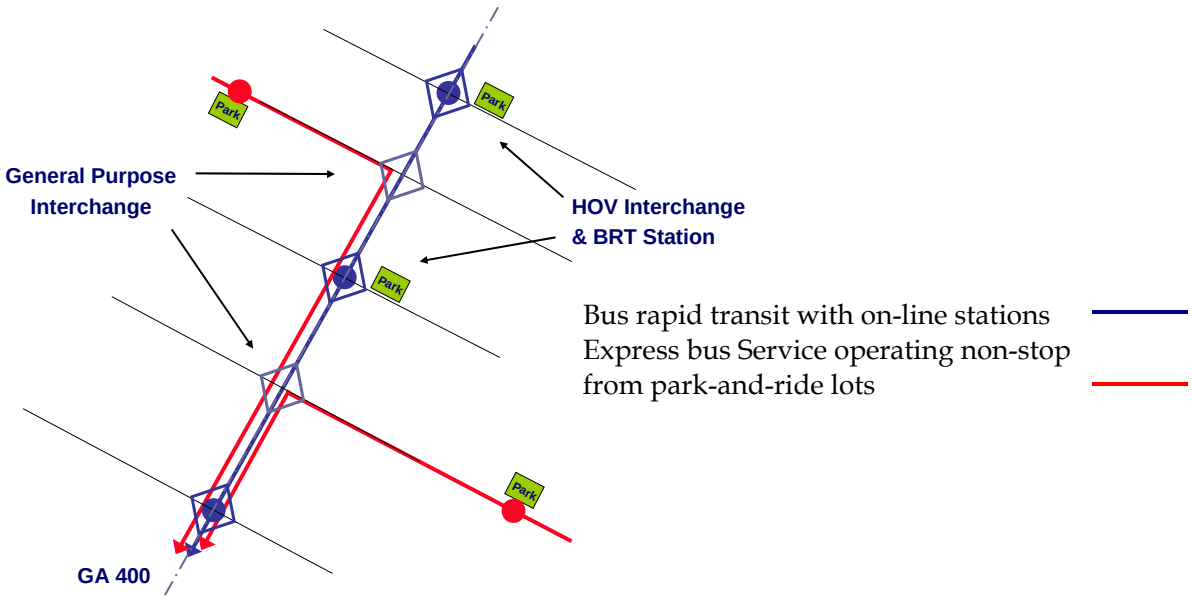
The major focus of investments in the long-term improvement program is to enhance the BRT/HOV system by adding HOV-only ramps at key locations in the corridor. A HOV-only ramp concept is shown in Figure 7.5-1. The locations of these ramps were obtained from the recently completed Georgia DOT *HOV System Plan*. With enhanced transit system capacity in the corridor, additional buses and park-and-ride lots will be needed to provide better transit service.

Figure 7.5-1 | Typical HOV-only Ramp



The concept of how the express bus services operate in conjunction with HOV interchanges is shown in Figure 7.5-2. Express buses (designated with red lines) could use either the general purpose or HOV interchanges, but the bus rapid transit service (designated by the blue line) would use primarily the HOV interchanges. BRT stations would be located at these interchanges to facilitate transfer to either local bus services or park-and ride lots.

Figure 7.5-2 | Bus Rapid Transit and Express Bus Operations



The recommended improvements to GA 400 in the long term are listed below and illustrated in Figure 7.5-3.

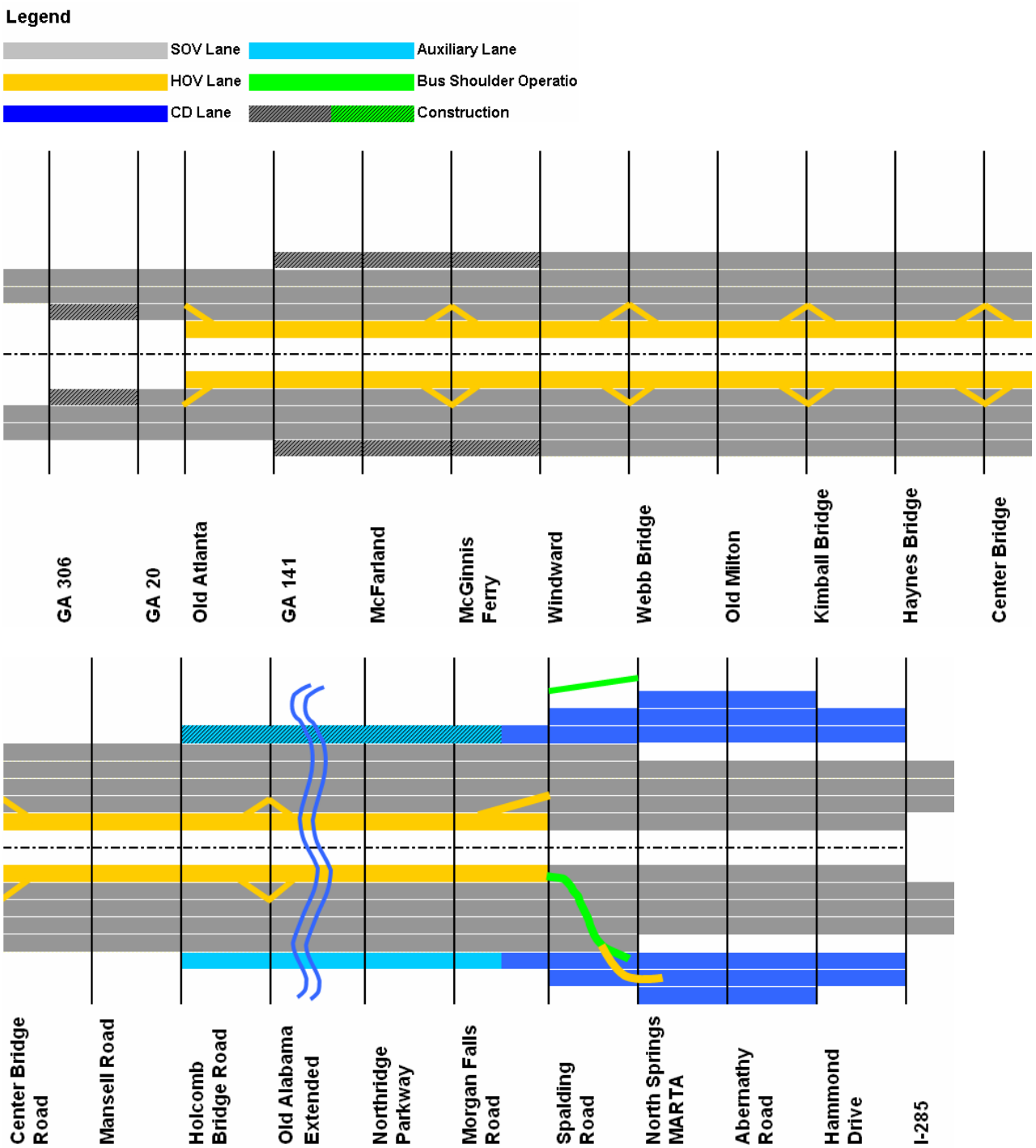
HOV Improvements

- Build HOV-only interchanges at:
  - Old Alabama extended
  - Center Bridge Road
  - Kimball Bridge Road
  - Webb Bridge Road
  - McGinnis Ferry Road
  - Old Atlanta Road

Highway Improvements

- Complete auxiliary lane in northbound direction from CD lanes to Holcomb Bridge Road
- Build general purpose lanes in the median in both directions from SR 20 to SR 306
- Build general purpose lanes in the shoulder in both directions from Windward parkway to SR 141.

Figure 7.5-3 | Long-Term Improvement Recommendations: North and South Sections of GA 400



Transit Improvements

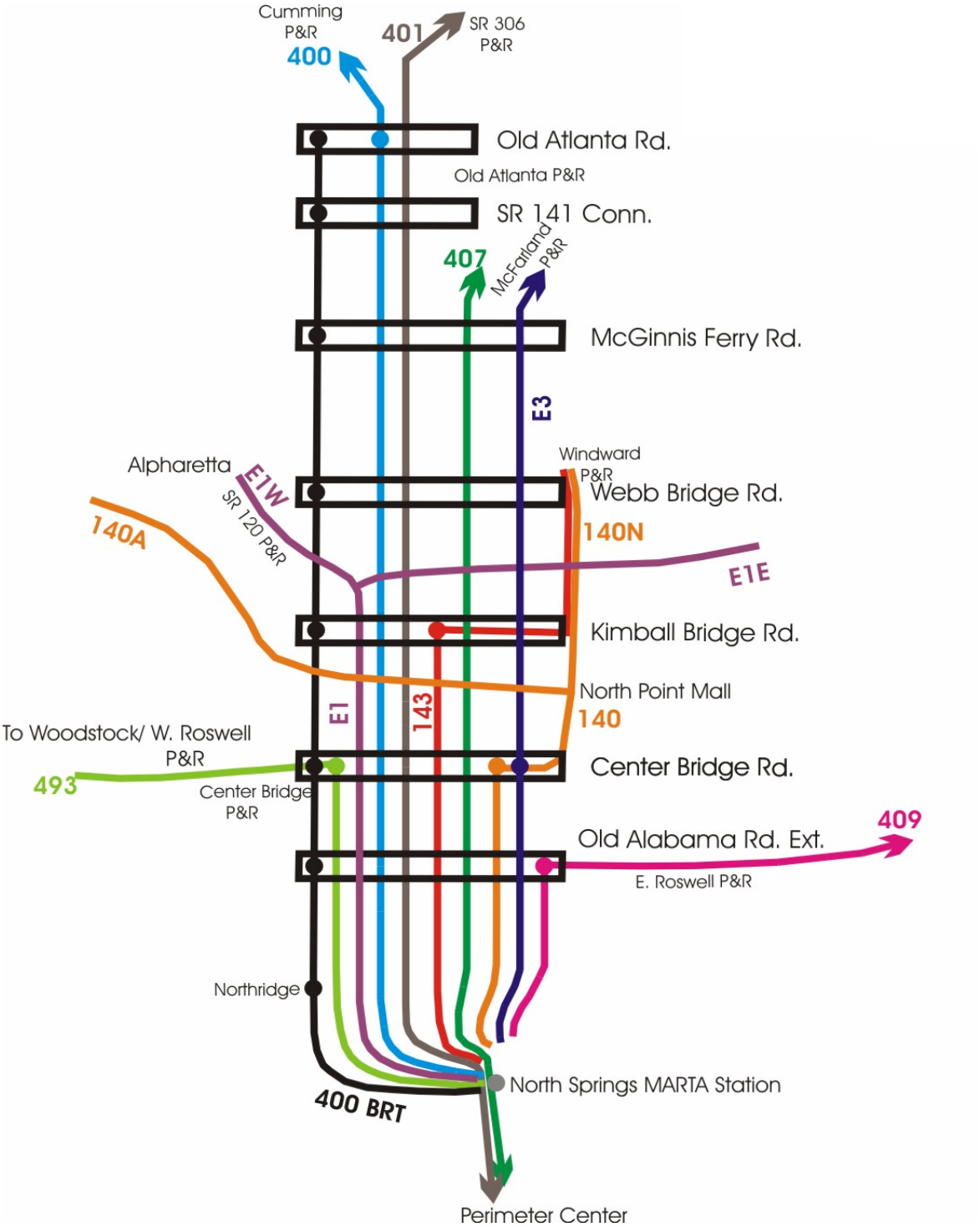
Table 7.5-1 shows the transit routes that would now be using the HOV lane on GA 400, given the HOV ramps constructed at the locations previously identified. In general, the policies guiding the selection of this transit strategy included:

- Add transit routes accessing HOV lanes on GA 400 HOV interchanges.
- Add BRT route that runs from Old Atlanta Road to the North Springs MARTA station with stops at the above interchanges.
- Further increase service frequencies as justified.
- Purchase 53 buses.
- Build 4 park-and-ride lots with a total of 930 spaces.

The proposed bus routes for the long-term improvement program are shown in Table 7.5-1 and Figure 7.5-4.

Routes listed in sequence of entering GA 400 HOV lanes, starting from the north									
Route	Origin	Destination	BRT Access Locations			Headway		Frequency	
			ON	Peak Stops*	OFF	Peak	Off-Peak	Peak	Off-Peak
401	N. Forsyth (SR 306)	North Springs Station	SR 306	Old Atlanta Road, SR 141 Conn, Windward Parkway	North Springs	30	60	2	1
400	Cumming	North Springs Station	Old Atlanta Road	All, exc Kimball Bridge Road, Holcomb Bridge Road, and Northridge Road	North Springs	15	3	4	2
407	S. Forsyth	**	Union Hill Road	All, exc Northridge Road	Hammond Drive	10	20	6	3
143	Windward Station	North Springs Station	Westside/ Morris	All	North Springs	8	15	7.5	4
140	North Point Mall	North Springs Station	Center Bridge Road	Center Bridge Road	North Springs	8	15	7.5	4
406	State Bridge Road / SR 141	North Springs Station	Dogwood/Old Alabama Road	Holcomb Bridge Road	North Springs	30	60	2	1
493	Woodstock	North Springs Station	Dogwood/Old Alabama Road	Holcomb Bridge Road	North Springs	20	60	3	1
Cumulative service levels north of North Spring Station						1.9	3.8	32	16
Cumulative service levels feeding into of North Spring Sta						2.3	4.6	26	13
Cumulative service levels south of North Spring Station						10	20	6	3
* cumulative peak highway is longer at some skipped stops; all routes make all stops during off-peak hours									
** proposed station for a new high-capacity transit line in the I-285 corridor between Cumberland and Doraville									

Figure 7.5-4 | Proposed Bus Routes, Long-Term Improvement Program



7.6 IMPROVEMENTS IN THE GA 400 CORRIDOR: FUTURE (>25 YEARS)

Similar to most planning studies, the NSAS conducted transportation analysis over a 20 to 25-year time horizon. The rationale for such a time horizon is that beyond 25 years it becomes very difficult to forecast the population, employment and other characteristics of both a community and a transportation system (e.g., the price of gasoline, or whether gasoline will even be the fuel of choice). However, it is prudent in a fast-growing area like the GA 400 Corridor not to foreclose transportation options that might be important for future trip-making in the corridor.

In the GA 400 case, with increasing population and employment, the demand for another form of high-capacity, high-speed transit might be justified in the future. This is especially true if local jurisdictions adopt some of the land use policies recommended by this Study.

As noted previously, the demand for improved transit service north of the North Springs MARTA station can, over the next 25 years, be handled most cost-effectively by BRT service. Beyond 25 years, however, investments in rapid-rail transit could very well be justified. Several different design concepts could be considered for an extended rapid-rail line. A rail line could replace the HOV lanes that will have been placed in the median of the GA 400 Corridor. In this scenario, the HOV-only ramps that were constructed during the long-term improvement program could be the location of rapid rail transit stations. Alternatively, an extension could be constructed on a separate right-of-way, most likely elevated due to right-of-way restrictions. Elevated rail and express bus lines are commonly found in congested and densely populated corridors.

None of the recommendations presented in this Study preclude implementation of these types of improvements in the +25-year timeframe.

7.7 RESULTS OF IMPROVEMENTS ON GA 400

The proposed improvements to GA 400 are aimed primarily at reducing travel congestion on this critical artery. The benefits of the recommended improvements can be illustrated in different ways. The following figures and tables present several indicators of mobility benefits for the short-, intermediate- and long-term. Table 7.7-1 shows the effect of all three improvement packages on average travel time between Buckhead and Cumming.

Table 7.7-1 Impact of Improvements on Travel Times

Year	Improvements	Auto Time (minutes)	HOV/BRT Time (minutes)
From Downtown Cumming – (A.M. Peak Period)			
2000	-	54	-
2008	None	57	-
2008	Short Term	54	-
2015	Short Term	57	-
2015	Short & Intermediate Term	50	41
2025	Short & Intermediate Term	55	43
2025	Short, Intermediate, and Long Term	53	37
2025	None	62	-
To Downtown Cumming – (P.M. Peak Period)			
2000	-	63	-
2008	None	66	-
2008	Short Term	61	-
2015	Short Term	62	-
2015	Short & Intermediate Term	59	42
2025	Short & Intermediate Term	58	43
2025	Short, Intermediate, and Long Term	54	38
2025	None	72	-

Table 7.7-1 illustrates the magnitude of the changes in travel time for commuters that could be achieved by the improvements that are recommended. Current (2000) travel time from Cumming to Buckhead in the a.m. peak period is approximately 54 minutes. With frequent accidents which can cause dramatic delays, the average travel time can be much longer. The evening commute time for the same trip averages nine minutes longer. The improvements suggested can keep pace with the growth of traffic and produce minor improvements to the travel times for the single occupant vehicle. The improvements provide a better choice for those individuals who can and are willing to rideshare. By 2025 an individual who chooses to car-pool or use transit (using the then-available HOV lanes) could save approximately 16 minutes over the time it would take a motorist to travel alone. This savings of half an hour a day in traffic is time that could be used to better advantage by most commuters.

Figure 7.7-1 illustrates the change in the daily hours of congestion along each segment of GA 400 that the improvements in the short-term, intermediate-term and long-term recommendations are expected to achieve. In the short-term the greatest points of congestion are forecast to occur from I-285 north to about

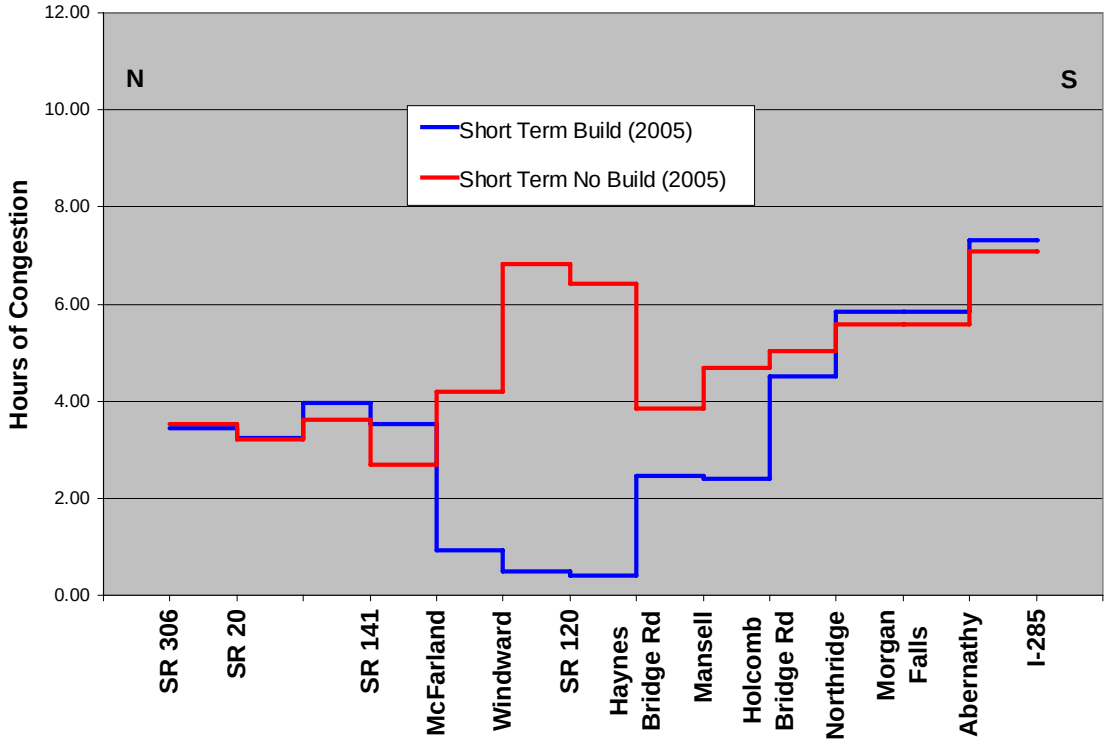
Windward Parkway, with over 6 daily hours of what can be described as stop-and-go travel. The suggested improvements in the short-term are directed at dealing with the sections of highway from Holcomb Bridge Road north to McFarland Road. They dramatically reduce the congestion on these sections of the highway.

The sections of GA 400 north of Holcomb Bridge Road require more extensive and costly projects which will take more time to accomplish. The intermediate-term recommendations manage to hold the line on the hours of congestion in these sections while dramatically reducing the hours of congestion on the sections of GA 400 north of McFarland Road.

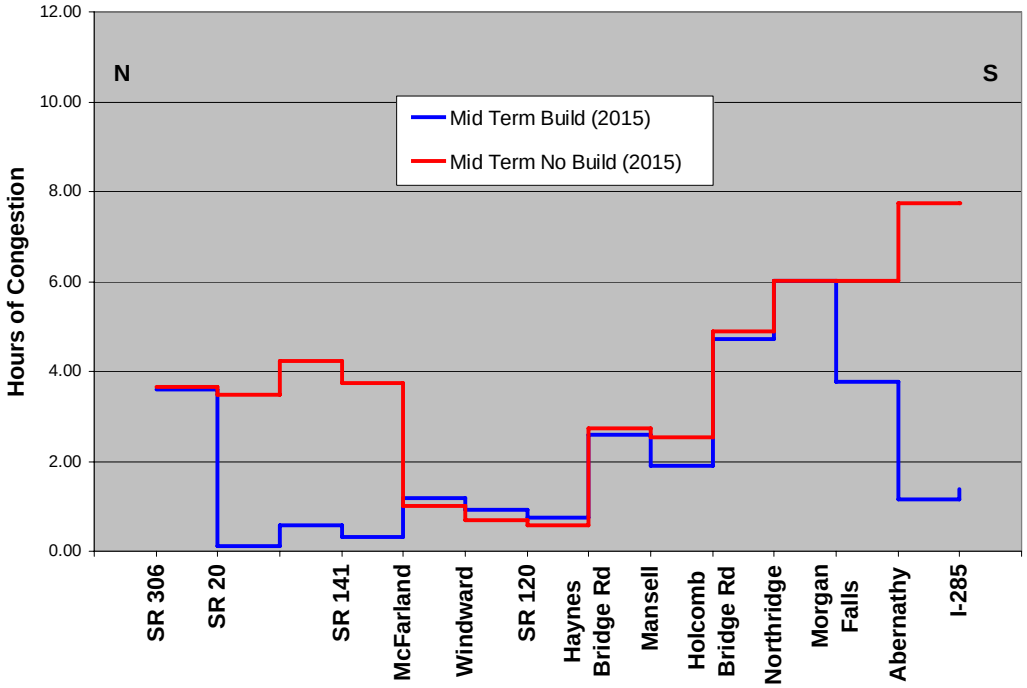
The completion of the auxiliary lanes on GA 400 from I-285 north to Holcomb Bridge Road on the west side of the highway, along with enhancements to the HOV and BRT systems, deal effectively with the bubble of severe congestion from Morgan Falls north to Holcomb Bridge Road.

Figure 7.7-1 Congestion Levels on GA 400 With and Without Improvement Packages

Short-Term Improvement



Intermediate-Term Improvement



Long-Term Improvement

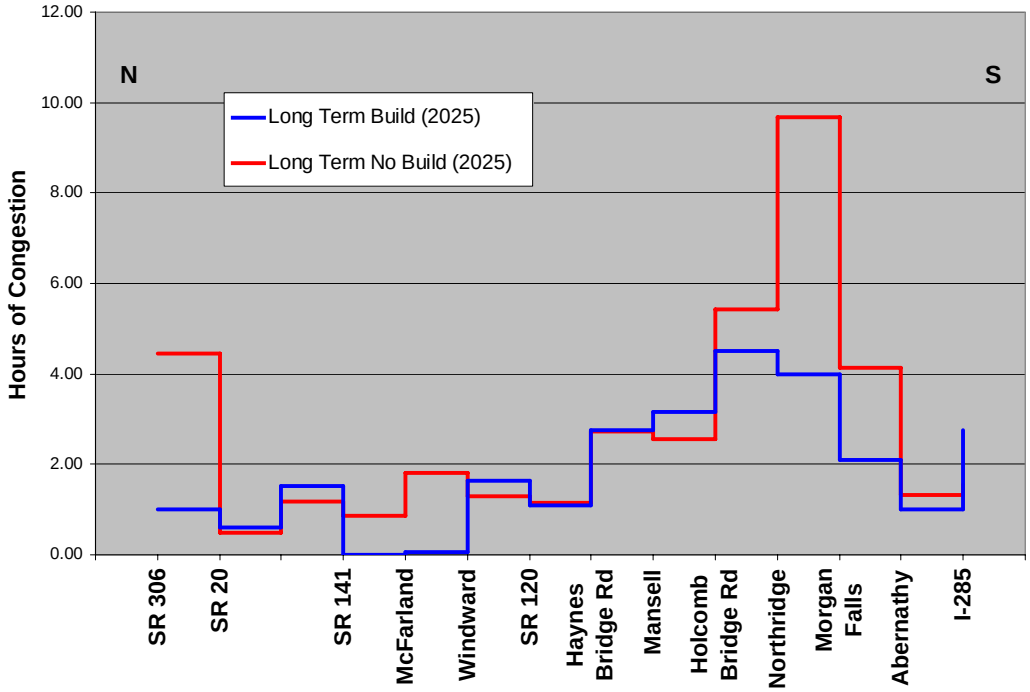
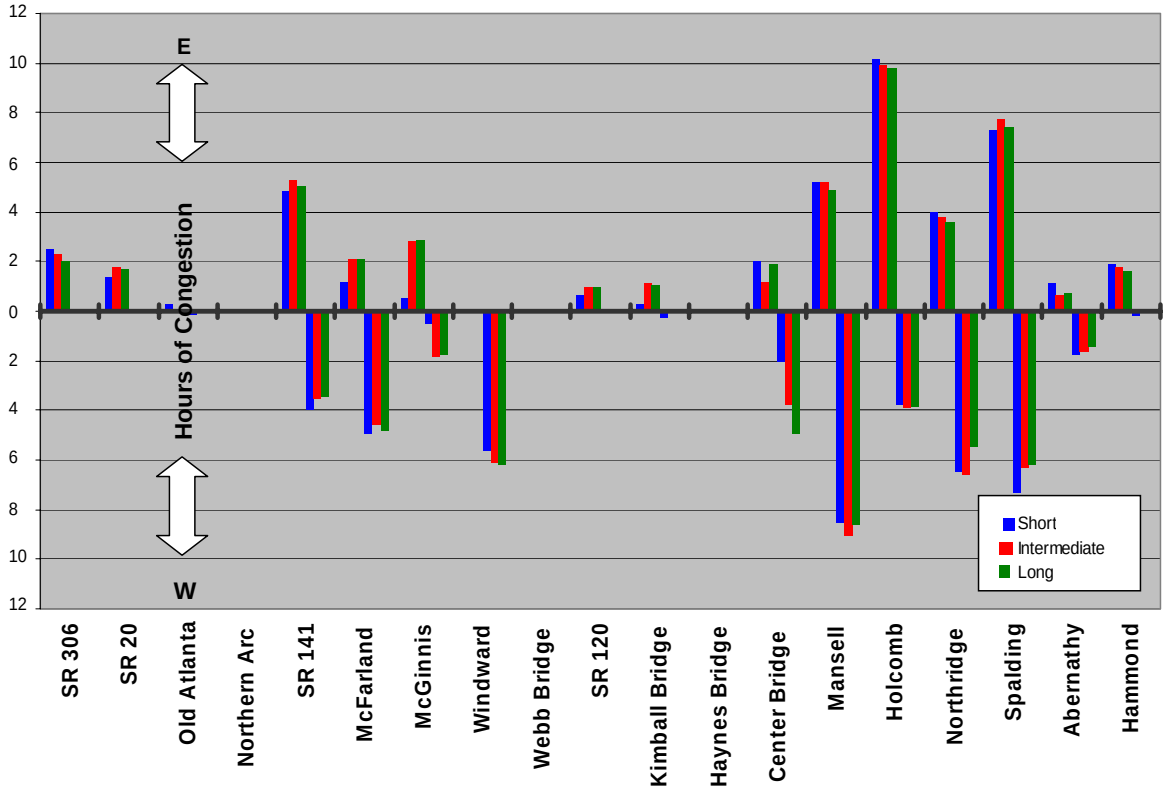


Figure 7.7-2 shows the corresponding levels of congestion on the major east-west arterials that intersect with GA 400. Although congestion levels do not decline significantly, it is important to note that the proposed improvements on these east-west roads do handle the increases in congestion that are projected over the next 20 years.

Figure 7.7-2 | Congestion Levels On East-West Arterials By Improvement Period, Daily Hours of Congestion



In addition, the level of transit ridership increases dramatically over existing ridership in the corridor as shown in Table 7.7-2.

Table 7.7-2 | Transit Ridership in the GA 400 Corridor

Year 2000	2,600
GA 400 Short-Term Improvements	7,000
GA 400 ARC Regional Transportation Plan (2025)	11,300
GA 400 Long-Term Improvements (2025)	11,900
GA 400 Long-Term Improvements With Transit - Friendly Land Use Policies (2025)	18,300

Note the impact of land use policies that are conducive to enhancing transit ridership. Such policies result in a 54 percent increase in transit ridership over the most ambitious GA 400 corridor plan not having such policies in place. This is an important illustration of the critical linkage between development decisions and the resulting performance of the transportation system.

7.8 IMPROVEMENT COSTS

Every effort was made during the development of alternatives at the short-term, intermediate-term and long-term stages to keep the costs of these projects within what was believed to be fundable within existing sources of funding, or modest expansions of those funding sources. Several of the projects are already incorporated within the ARC 2025 RTP and are in various stages of planning, right-of-way acquisition or construction.

In the short term, funding for the proposed transit projects, including the anticipated widening of the shoulders from Windward Parkway to the North Springs MARTA Station to accommodate buses, is already in-hand and funding is anticipated in the ARC 2025 RTP for the widening of GA 400 from Haynes Bridge Road to McFarland Road.

In the intermediate-term, funding for the construction of the CD road system from I-285 to just north of Spalding Road is in the ARC 2025 RTP, as is funding for the widening of GA 400 from McFarland Road to GA 20. The CD system is already at the stage of right-of-way purchase. Of the $267 million in capital required to fund the intermediate term projects , $144 million is already anticipated in the current ARC 2025 RTP, over one-half of the total needed.

The funding shortfall for the Corridor intermediate-term recommendations and long-term recommendations could be achieved from a number of sources, including bonding supported by a continuation of the current GA 400 toll

agreement and pledges of support from the CIDs in the Corridor. Other possible sources of funding are discussed at length in Chapters 4, Analysis of Financial Strategies, and Chapter 6, Implementation of Alternatives.

Table 7.8-1 | Summary of Costs in millions

	Short-Term	Intermediate-Term	Long-Term
Highway	$23	$146	$39
HOV	$0	$106	$61
Transit	$40-$52	$15	$37-$40
Total Capital Cost	**$63-75**	**$267**	**$137-$140**
Annual Operating Cost	**$2.4**	**$3.6**	**$15.2**

Note: Current year (2003) conceptual costs.

7.9 SUMMARY

The proposed improvements to GA 400 are aimed primarily at enhancing the mobility of GA 400 Corridor travelers. These enhancements provide feasible alternatives to the single-occupant vehicle and reduce travel congestion on this critical artery and on intersecting arterial roadways. The short-, intermediate-, and long-term improvements to GA 400 follow a logical progression that provides a phased investment process leading to a high-capacity, high-speed bus rapid transit service. In addition, these improvements provide significant reductions in expected travel delay on GA 400 itself over and above the levels expected without such improvements.

Two critical decisions had to be made during the analysis for this Study. First, the analysis showed that the most cost-effective investment in high-speed, high-capacity transit was in a bus rapid transit system. A similar level of transit ridership can be attracted by the BRT system as will likely ride an extended MARTA heavy rail line to Windward Parkway. The cost of the rail line extension is estimated to be significantly higher than that associated with the proposed design of the BRT system. Thus, the BRT system was recommended for implementation.

Second, although the Georgia DOT has adopted a policy of using a barrier - separated HOV design on urban freeways in the state, this Study determined that placing such a cross section in the GA 400 alignment would create significant costs in bridge reconstruction and additional right-of-way. Further travel demand analysis showed that the concurrent lanes would actually provide a higher level of service, accommodating more HOVs and taking more vehicles

off of the general purpose lanes. Thus, a concurrent HOV lane design has been recommended for this corridor.

Thus, the key actions to meet the Study objectives include:

- Make transit attractive early by providing for operations on shoulders
- Add SOV capacity early where needed, and principally in the median
- Develop concurrent rather than barrier-separated HOV lanes
- Build CD System north of I-285
- Develop BRT on HOV lanes rather than extending MARTA rail

Finally, as has been shown in other elements of this Study, the influence of transit-conducive land use policies is dramatic and strongly beneficial to transit system performance.